Products Finishing

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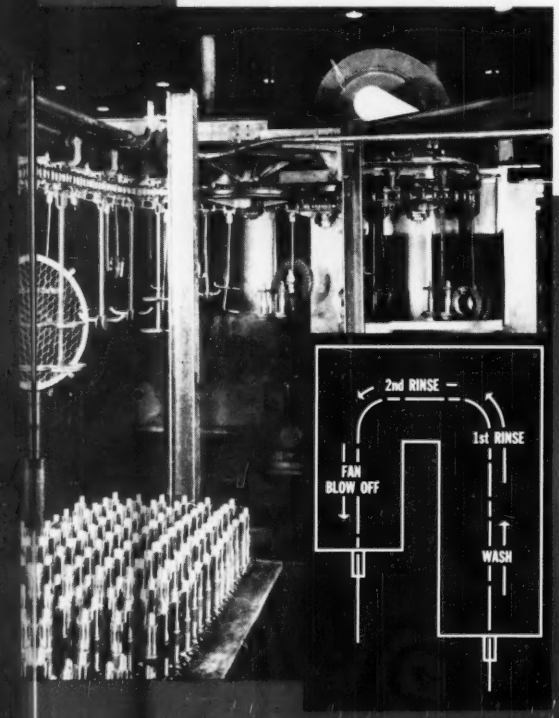

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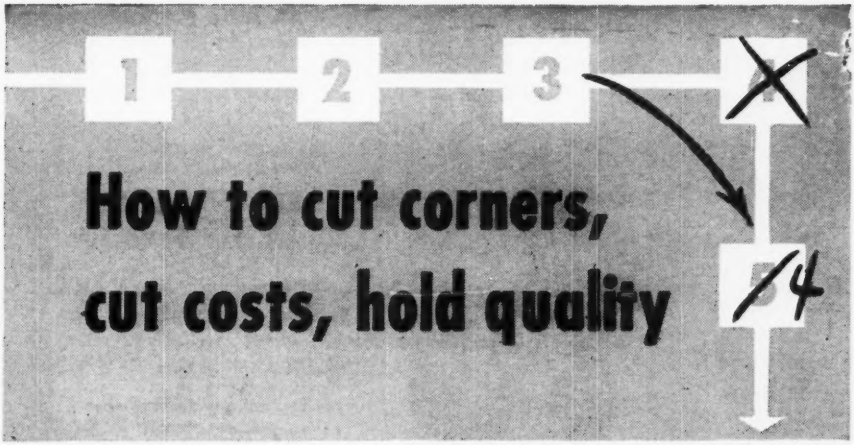

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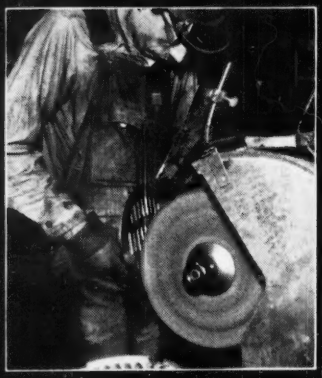

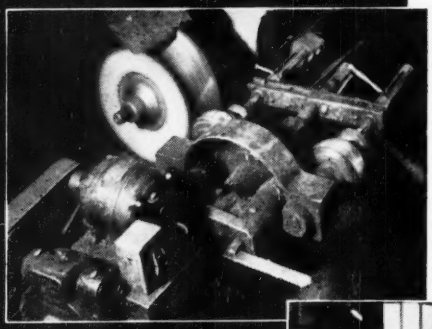

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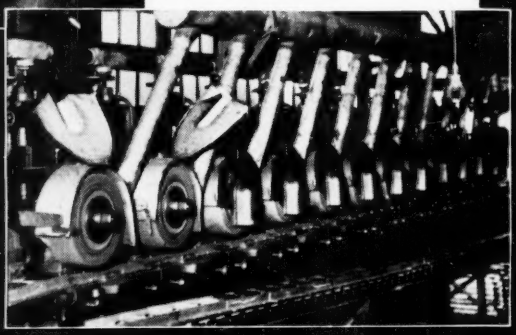

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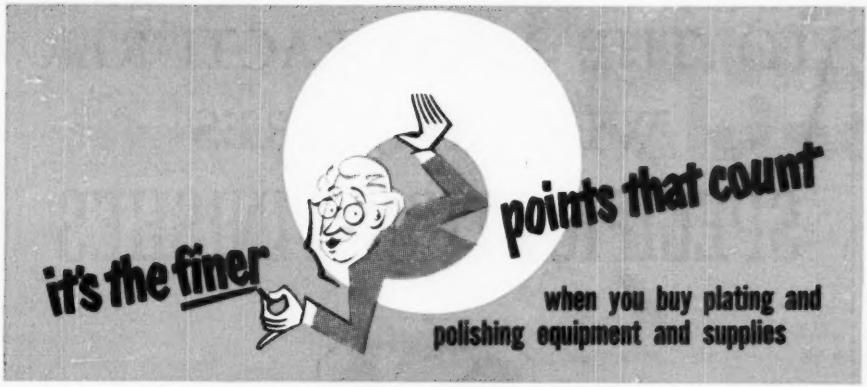

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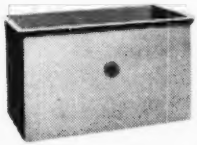

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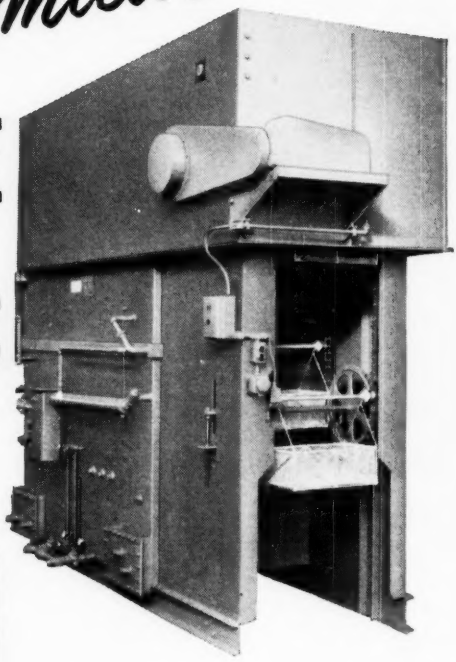

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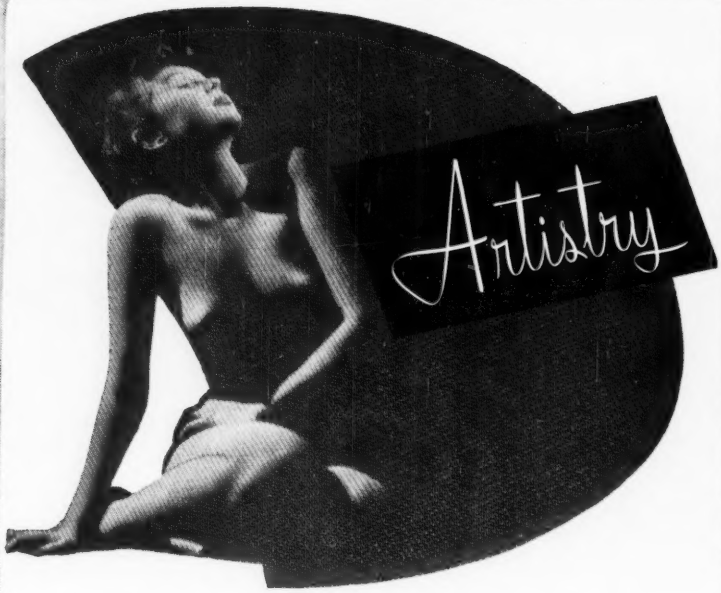

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Pf editorial

Vol. 14, No. 12

SEPTEMBER, 1950

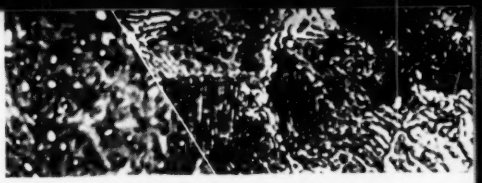
Give Your Finishing Room The Air!

During the past few years air conditioning has gained general acceptance for application in offices, stores, theaters, public buildings, and even some complete industrial plants. There is a growing realization of its importance in spray finishing departments, and many installations of necessary equipment to supply filtered, temperature-regulated air to such departments have been made.

Over the past 20 years conditions in spray finishing rooms have gradually been improved with a corresponding improvement in productivity and product quality, as well as in employee relations. When spray booths first came into use, the spray booth exhaust fan had a tendency to pull dirt-laden air from all parts of the shop in question through the spray finishing room where the parts in process were subjected to the hazard of contamination with shop dirt of all kinds. When the trend to white kitchen equipment of all kinds, whether finished in lacquer, enamel, or porcelain enamel, became firmly established, the hazard of black speck contamination of the white finish made necessary the thought and attention on the part of plant engineers and equipment suppliers which resulted in the installation of pressurized spray rooms for porcelain enamel finishing, as well as for paint finishing. It soon became obvious that air introduced into the plant must be filtered and controlled as to temperature so that conditions in the spray room would be fairly uniform throughout the year.

The advantages to be gained by controlling conditions of application require little comment. The fact that products are being finished under standardized temperature conditions makes easier the control of finish quality, and ensures the highest quality finishes. Productivity is likewise increased because fewer rejects are experienced. Improvements in product quality, plus greatly improved working conditions and employee comfort, make the cost of necessary air handling and conditioning equipment a sound investment paying good dividends.

Ezra A. Blount



The Metal Under the Plate

By HOWARD E. BOYER
Chief Metallurgist
American Bosch Corporation
Springfield, Massachusetts

ELECTROLYTIC deposition is usually defined as "the production of a metal from a solution of its salts by passage of electric current through the solution." This is, likewise, the basic principle of all electroplating as it is regularly employed today in commercial practice. Since most metals applied by electroplating are non-ferrous, these plating processes might be classified under non-ferrous metallurgy. Although plating is applied extensively to the alloys of copper, aluminum, zinc and others, by far the largest part of our commercial plating is applied to the iron base alloys. The electroplating process serves a wide variety of purposes which includes general protection against corrosion, protection of base metals against some specific chemical reaction, the formation and retention of a desired appearance, formation of surfaces which are resistant to specific types of wear, and the building up of dimensions on parts subject to wear.

When one pauses briefly and considers the important role played by electroplating in our present day engineering world it is easy to imagine some of the conditions which would exist if electroplating had never been developed. Not unlike many other physical and chemical processes employed in manufacturing, the basic principles of electroplating are simple. Most of

Howard E. Boyer

HOWARD E. BOYER has been in the metallurgical field since 1929 at which time he was employed at the Cooper-Bessemer Corp. in Mt. Vernon, Ohio. He studied metallurgical engineering at Ohio State University, returning to the Cooper-Bessemer Corp. at their Grove City, Pennsylvania plant in 1934. He was employed in their metallurgical department until 1939 at which time he joined The American Bosch Corp. in Springfield, Massachusetts as chief metallurgist.

Mr. Boyer has been an active member of The American Society for Metals and other technical societies for many years and is a past chairman of the A.S.M. Springfield Chapter.

the difficulty stems from the multiplicity of variables which persists in all phases of the process in practice, so that a close and constant control backed by technical assistance is necessary if uniformly desirable results are to be produced.

It does seem that studies in electroplating have been focused primarily on the electro chemical reactions in the bath which are of paramount importance. Metallurgical aspects relative to the composition and physical condition of the base metal are also important factors and have too frequently been neglected in imparting knowledge to the individuals who need it most. This discussion will be confined to the variables presented by base metal conditions.

First it must be understood that the bond between the plate and the base metal is, or at least it should be, considerably more than one of a mechanical nature. We often hear the term adhesion used in discussing electroplating and the base metal. This may be the correct term if we go strictly by the definition of adhesion which is usually defined as the force which holds unlike materials together. Conversely, cohesion is defined as the power which holds like materials together. Even though the plate and base metal are not like materials they are similar materials so that if an actual alloying action takes place the bonding of an electroplate can be considered as one of a cohesive nature. We know from the principles of physical metallurgy as well as experience in plating that electrodeposited metal is actually alloyed with the base metal to a marked degree. Plating which flakes or peels away under ordinary conditions may be indicative of poor alloying. Just how thick this alloyed layer is or should be is difficult to say because it is, relatively speaking, extremely thin, so that its measurement by any metallurgical microscope of the optical type is next to impossible. More recent studies by means of advanced scientific instruments have proved that this alloy layer is generally thicker than had been presupposed.

One method which has been employed to prove that the electroplated metal does alloy with the base metal is to test the strength under repeated stress of certain steel test specimens which were made and heat treated so that they were identical in structure and would survive, without failure, the same stress for an infinite number of cycles in a reverse stress testing ma-

chine. It has long been known that such fatigue test specimens are extremely vulnerable to surface variations. Even a small amount of surface decarburization, which lowers strength in the surface layers, will effect a

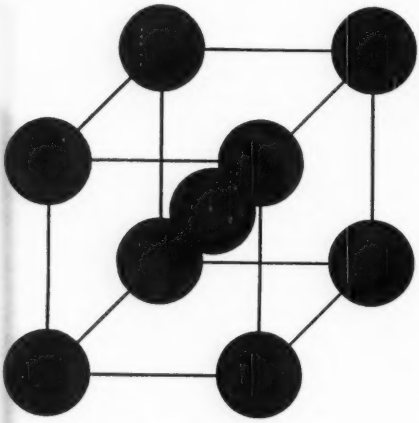


Fig. 1—Atom arrangement in iron lattice.

marked decrease in the fatigue strength of a given steel. It has also been found that a low-strength metal such as cadmium or zinc, plated on to steel fatigue test specimens, tends to lower the strength, while a higher-strength metal plated on to otherwise identical test specimens will tend to increase the resistance to fatigue failure. Since paint and other similar organic materials have no effect on the fatigue strength, it is obvious that an electroplated metal does alloy with the base metal.

Alloying is dependent on a simple principle of physical metallurgy which Fig. 1 serves to illustrate. Figure 1 shows a model of the atom arrangement in the pure iron crystal as it exists at room temperature. This type is called a body-centered lattice because it has one atom in each corner, and one in the center or a total of nine atoms forming the lattice. In some cases elements will alloy by interstic-ing—that is, one metal will actually dissolve in another because some of its atoms enter the spaces between the atoms composing a lattice such as shown in Fig. 1. A more common form of alloying and the type which serves as a working hypothesis in electroplating is known as alloying by exchange. By this is meant that atoms from a lattice, as shown on Fig. 1, leave and are then replaced by atoms of the new metal. It naturally follows that the desired condition in electroplating is to obtain a complete atom exchange in the surface layers. It is easy enough to comprehend the necessity for surface alloying, so that logical questions at this point are "how can this alloying be accomplished in practice, and, what are the conditions which tend to inhibit alloying action?" From studies of physical metallurgy and electrochemistry the answer to the latter question is not particularly difficult, but the former question is not so easily answered. Before the surface layers of any metal will combine with another metal they must be chemically active to some degree. Some metals are inherently far more active than others; consequently no two base metals present the same problem. Unquestionably some metals will corrode more rapidly than others under the same conditions and, generally speaking, those which are extremely vulnerable to corrosive attack are likewise easier to electroplate because of their higher degree of chemical activity.

The term "clean surfaces" is one which possesses a broad meaning in the electroplating field. Cleaning is definitely divided into two distinct phases—(1) the removal of grease, dirt and other foreign materials, and (2) removal of oxides which inhibit alloying action. The first phase of cleaning is not one which usually of-

fers a major problem. The various modifications of degreasing, alkaline cleaners, and so on, are well known to electroplaters and require no further discussion in this treatise. The problem of oxide removal is far more complex and varies with the base metal composition and microstructure. The presence of the thinnest oxide films tends to establish a barrier through which atoms do not pass, thus preventing the necessary alloying from taking place. In many cases these oxide films are not perceptible to the eye so that a surface which appears thoroughly clean may be chemically passive. Some metals are easily rendered oxide free. A low carbon steel containing little or none of the alloying elements of nickel, chromium or molybdenum is probably one which is most easily obtained free from oxide. Fortunately for the electroplater, this particular material comprises an appreciable percentage of the material which is regularly electroplated. Likewise the alloys of copper, as base metals, comprise a sizeable portion of our electroplating and they are, in most forms, easily activated in an electrolytic bath. These materials just mentioned are relatively simple in composition and structure so that even though oxides are present to a noticeable degree they are not complex in nature so they are rather easily removed.

Figure 2 shows the microstructure of a low carbon non-alloy steel at 150 magnification. The carbon content of this steel is in the order of 0.15 per cent and, with exception of small amounts of phosphorus, sulfur and manganese, the remainder is essentially pure iron. The white grains shown in Fig. 2 are, for practical purposes, pure iron, while the black grains are what we commonly call pearlite, or tiny aggregates of iron and iron carbide. This composition and structure represent a condition which is probably one of the most ideal for electroplating. In fact, it seems more ideal than a structure composed entirely of the white grains or pure iron. A few pearlite grains seem to nucleate chemical attack, thus promoting surface activity. As the carbon content of the steel is increased to approximately 0.45 per cent, which is a common range for shafts or other structural parts, the pearlite grains in-

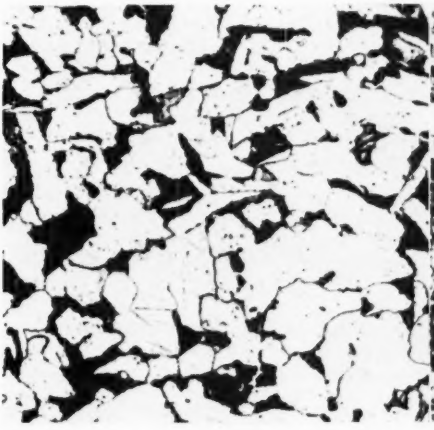


Fig. 2—Microstructure of low carbon steel—annealed. Magnification, 150X.

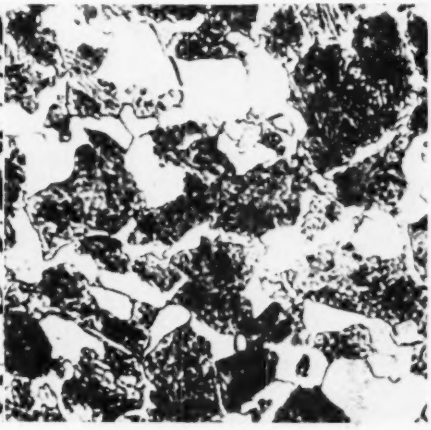
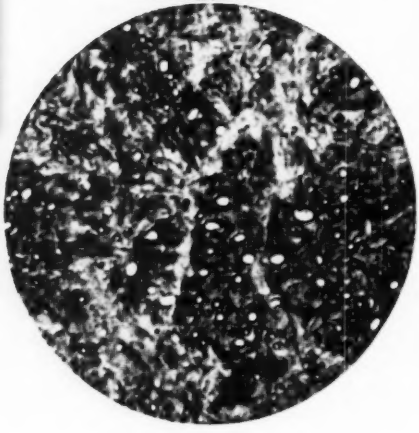


Fig. 3—Microstructure of medium carbon steel—annealed. Magnification, 150X.



crease in proportion to the iron grains as shown in Fig. 3, which is another photomicrograph, taken at 150 magnification, of a medium carbon, non-alloy steel in the annealed condition. This grade of steel apparently possesses about the same properties as the one shown in Fig. 2 as far as alloying properties are concerned. As the carbon content is increased still further and approaches 1.00 per cent the microstructure becomes entirely composed of pearlite grains as shown in the photomicrograph in Fig. 4. This picture was taken at 500X (magnification) so as to resolve the structure of the pearlite grains. This steel is likewise non-alloy, but due to the high carbon content and the absence of pure iron grains, it is inherently less active in an electroplating bath.

So far only steel structures in the annealed state have been discussed, but it is already obvious that the electroplater may be confronted with additional problems if he does not know the composition or physical structure of the base metal. When steel is heat treated, another set of conditions is presented. Figure 5 shows the microstructure at 1000X of a 1.00 per cent carbon steel after it has been fully hardened by heat treatment, but not tempered. This particular structure is an aggregate of iron and iron carbide known as martensite. Still considering a composition with no other alloys this structure is probably the least active and consequently the most difficult to electroplate satisfactorily. Fortunately plating would rarely be performed on a fully hardened, untempered structure. When the same struc-

●

Fig. 4 (top)—Microstructure of high carbon steel—annealed. Magnification, 500X.
Fig. 5 (center)—Microstructure of high carbon steel—fully hardened. Magnification, 1000X.
Fig. 6 (bottom)—Microstructure of high carbon steel—hardened and tempered. Magnification, 1000X.

Fig. 7—Unetched structure of gray iron. Magnification, 100X.

ture is tempered, a gradual precipitation of a new constituent known as secondary carbide takes place. This newly-formed constituent tends to nucleate any chemical action in the surface layers which is advantageous in plating.

Figure 6 shows the microstructure of a tempered martensite structure. The small white particles are the carbide which has precipitated from the matrix during tempering. The hardness of this structure has decreased considerably as compared to the value of the martensitic structure shown in Fig. 5. It is true that the steel structures and compositions discussed up to this point may vary considerably in surface activity, although they all can be plated provided they are thoroughly cleaned and deoxidized. Oxides are not usually difficult to remove from straight carbon steels such as those discussed above. Blasting or other mechanical methods tend to remove the oxides and, at the same time, cut the surface so that they can be more readily activated in the plating bath. The old and well known method of pickling in reducing acids, such as hydrochloric or sulfuric is still one of the better means of rendering surfaces active. Oxidizing acids such as nitric tend to oxidize and subsequently passivate steel surfaces rather than to activate.

Other iron-base alloys tend to offer more complex problems to the electroplater. Cast iron is one which is usually troublesome. It can, of course, be plated with a variety of different metals, but the degree of cohesion is seldom as good as that created by the carbon steels. Composition and microstructure are again responsible for the difficulties encountered. Cast iron may be composed of almost an infinite number of composition combinations and its microstructure will vary over a wide range. Cast iron usually contains 3 to 3.5 per cent of carbon, the major portion of which exists in the form of free carbon or graphite flakes. The smaller portion is combined with the iron as carbide which is dispersed through the matrix similar to steel. Figure 7 is a photomicrograph taken at 100X of a polished, but unetched, specimen of ordinary gray cast iron. The black particles shown in this picture are graphite carbon which tend to inhibit an alloying action. Figure 8 is another photomicrograph of a cast iron specimen showing the graphite as well as the microstructure of the matrix after light etching. The latter photomicrograph was taken at 500X. Most cast irons are also composed of 2 to 3 per cent silicon which also tends to inhibit chemical activity, especially ly when the oxide of silicon is present.

Pickling with reducing acids as well as other chemical means, and grit blasting are somewhat effective in activitating cast iron surfaces though

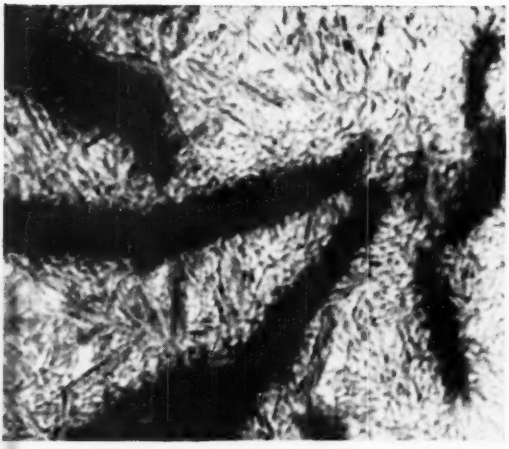


Fig. 8—Microstructure of heat treated cast iron—etched. Magnification, 500X.

even at best results are likely to be disappointing due to the structural and composition characteristics of the iron. In some cases cast iron parts have been passed through a suitable furnace at elevated temperatures in a reducing atmosphere, which serves to reduce the oxides and burn out graphite carbon in the surface layers at the same time. This is a most effective method for a preliminary treatment prior to plating or other surface treatment, but the cost is usually high.

Most of the alloying such as nickel, chromium, molybdenum and tungsten, which are commonly added to steel, tend to inhibit surface activity irrespective of the carbon content. The degree to which any alloy or combination of alloys will tend to slow down the alloying action in plating is apparently about proportional to the degree to which corrosion resistance is inhibited. As these alloys reach the higher percentages such as the amounts found in the large family of iron base alloys known as stainless steels, it becomes increasingly difficult to effect an alloyed layer between the electrodeposit and the base metal. This is due primarily to the fact that the element, chromium, which is the touchstone of our stainless steels, forms a thin transparent layer of oxide on the surface through which it is most difficult to promote an atom exchange. All attempts to completely reduce this oxide usually fail to produce the most desirable results. The use of reducing acids is reasonably effective for the oxide reduction, but the difficulty arises from the fact that a new protective film of oxide tends to form immediately before the work can be subjected to the plating bath. Grit blasting used in conjunction with treating in a reducing acid is one of the most effective means but many applications will not permit the rough surfaces resulting from grit blasting. Vapor blasting has been received with increasing popularity during the past few years. It was originally designed as a method of cleaning, but it has been found equally useful in promoting a finely pitted surface condition which is rarely objectionable and yet is extremely active chemically. Thus it can be employed to play an important role in electroplating for breaking down surface oxides.

The author has often encountered difficulty with certain die castings made of brass, aluminum or even zinc and their tendency toward possessing extremely passive surfaces. Studies of this condition never revealed results which were entirely conclusive, though it has been indicated that some microstructures existing for an appreciable depth from the surface were responsible for the passive condition occasionally encountered. Rate of cooling in the dies apparently has some influence.

This short treatise has not, in any

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way, been intended as a short course in metallurgy for the electroplater. Likewise, it has dealt principally with generalities and was not intended to give information for solving specific problems in this broad phase of the engineering field. It was intended to emphasize the fact that a sucessful electroplater must always consider the variables introduced by the widely varying metallurgical properties possessed by the base metal.

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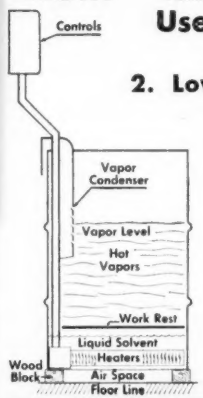

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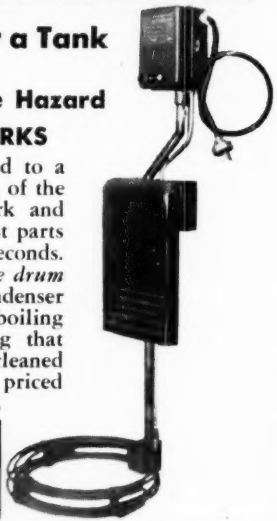

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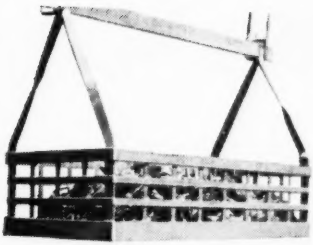

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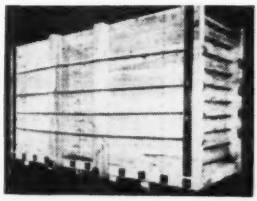

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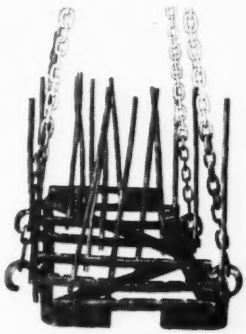

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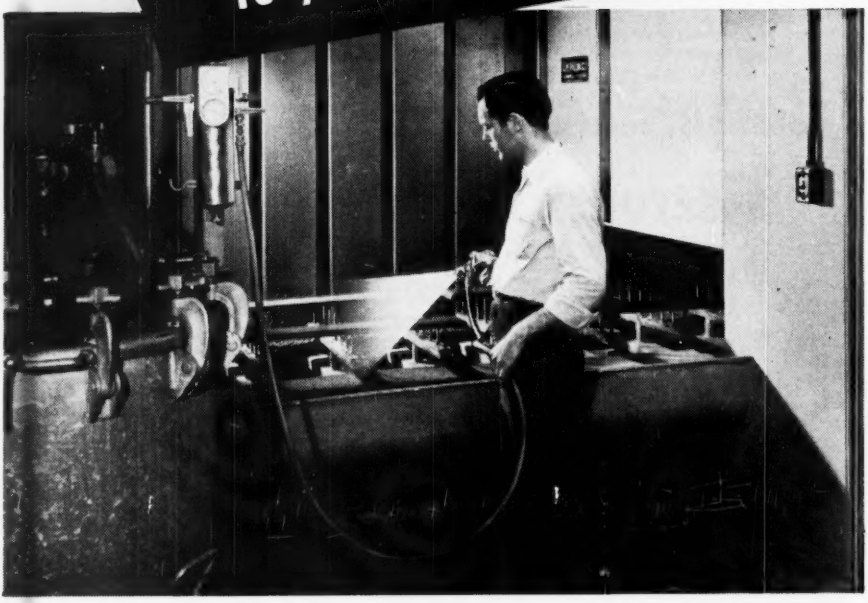

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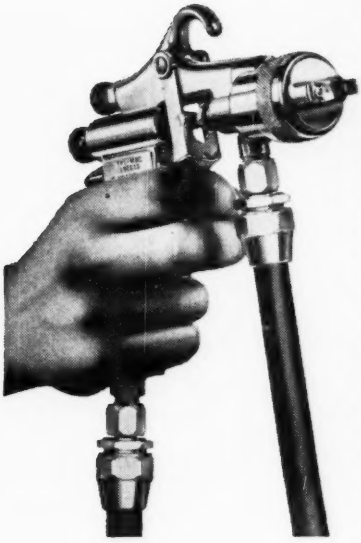

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PART II

Pressure-Sensitive Tapes, Die-Cut Stencils, Papers—Applications and Uses

By ARTHUR P. SCHULZE

A Special Survey-Report

FEATURE

So numerous and diverse are the interesting applications and uses to which masking tape is put in product finishing and other production operations, the space limitations preclude their complete review here. The most common examples include: spray painting; masking of control panels; masking of adding machines, typewriters, and so on, where sharp contrast between crinkle and glossy finishes is required; repaint shops (public utilities, transportation companies, fleet operators); masking of refrigerators, stoves, and so on, at floor line, where black strip is painted on to prevent marking and scuffing of appliances by mops and shoes; and sandblasting (aircraft industries, railroads, masking for electroplating, protection from sandblasting[1]). Thus, look almost anywhere—in virtually any shop or plant in any industry or field where spray painting is carried on in connection with production or maintenance—and you will see pressure-sensitive tapes saving time, improving results, cutting costs all along the line. As "proof of the pudding," a number of case histories are cited.

At the plant of The Leader Baby Carriage Company, New York, Per-

Pressure-sensitive tape, paper, die-cut stencils, form-fitting metal masks, liquid masking materials, peelable plastic coatings, and allied products—all have their proper place in facilitating finishing and fabrication of a wide array of products in many different industries. Each product or process, serving a useful function as it contributes to faster production, better product quality, lower unit costs, is reviewed in this searching survey of modern industry's utilization of masking materials and methods. Of timely interest to all finishing engineers, department superintendents and shop foremen, the following discussion is the second of four articles devoted to this important subject.

MATERIALS AND METHODS AND SPRAY FINISHING

macel 77 Paper Masking Tape facilitates fine finishing in three ways: (1) by outlining the areas of baby carriages to which each color is to be applied; (2) by permitting fast and accurate striping between two tape strips with sharply-defined areas; and (3) by masking and protecting the chromium trim and other carriage parts during the spraying operation. Thanks to tape, the whole job is done quickly, easily, economically.

An additional interesting use of Permacel 77 Tape in this plant is found in a holding application which simplifies what would otherwise be a difficult procedure—that of installing the leather lining in the carriages. In order to provide surfaces to which the linings can be tacked, it is necessary to affix wood strips to the steel frames. This is done by binding strips

Fig. 1—Protective taping of the stern of New York Central Railroad's "20th Century Limited"—one of America's most famous crack passenger trains—with Permacel masking tape prior to spray painting.
(Photo courtesy Industrial Tape Corp., New Brunswick, N. J.)

in place with Permacel tape.

In this holding application, work is expedited by the instant adhesion of the Permacel tape, thus permitting its

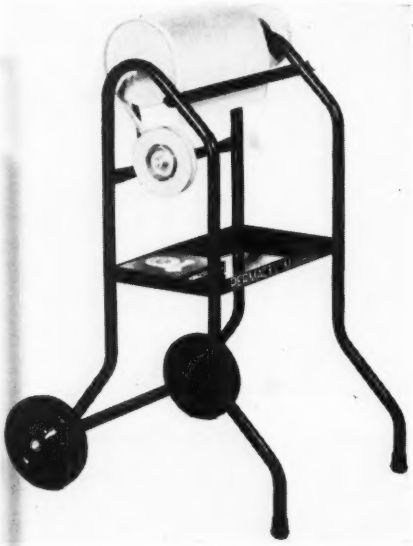

Fig. 2—The Permacel No. 7K Masker contains a roll of No. 750 masking paper, a roll of Permacel No. 77 masking tape mounted in place so that masking paper, one edge of which is attached to masking tape, may be pulled from the roll and cut by the operator to any desired length. An auxiliary roll of Permacel 77 is also mounted on the Masker and from this roll small tabs of masking tape may be removed from time to time as required. *(Photo courtesy Industrial Tape Corp., New Brunswick, N. J.)*

application in a continuous, unbroken spiral that binds the wood strips and the frame members securely and permanently together. There is no loosening of the tape binding as a result of drying and embrittlement, as was previously the case when gummed tapes were used. The facility with which Permacel 77 is applied, and the easy and clean removability of the masking strips in the spray painting operation, are credited as important contributions toward speeding production and keeping quality high at Leader.

One prominent truck-trailer manufacturer uses a special masking procedure in triple-toning truck-trailers. Following thorough cleaning of all metal surfaces, parts and areas not to be painted are masked with paper held in place with tape, and the entire trailer given a primer coat. Upon drying, the lower panel is sprayed with blue synthetic enamel. The operator tries to avoid, as much as possible, a 10-inch center panel formed by two half-round moldings.

After this coating has dried, the lower section of the trailer is masked, using a sheet of 60-lb. kraft paper of the same width as this lower panel. Paper is held in place at the upper edge with 1-inch tape, which is smoothed out carefully and pressed down tightly to the painted surface to prevent any underspray. Then, to hold the masking paper in place so as not to fan out from the trailer body, the paper is taped down at approximately 3-foot intervals with short pieces of tape, which are applied vertically.

The 10-inch middle panel, after spraying with grey enamel and drying, is masked with kraft paper, which is held in place by tape smoothed out along the upper horizontal metal molding. Short pieces of tape, vertically applied, hold the masking paper flat against the trailer body. They extend partly over the masking paper protecting the bottom panel. Spraying of top panel section with white enamel completes trailer body finishing.

Similarly, masking paper and tape prove indispensible in automotive refinishing and body reconditioning shops. For example, in those shops using the high-temperature baking "Durabake" process developed by Fostoria Pressed Steel Corporation, a specially designed heat-resistant, high-temperature tape, Permacel 71 Whitework Masking Tape, is used. Headlight glass, windows and bright metal work are all protected by paper

masking, which is easily applied and held in place with this tape. After the infra-red baking treatment is completed, all paper masking is easily removed as the tape strips off easily and quickly.

During the past year, two devices have been designed to facilitate and expedite masking operations on automotive equipment. One is the Permacel Masker (see Fig. 2), made by Industrial Tape Corporation; the other is the "Scotch" brand Apron Taper (see Fig. 3), made by Minnesota Mining & Manufacturing Co. These portable, easily movable units dispense taped aprons of masking paper ready to be applied to the work, thereby saving the time (15 per cent and more) formerly used in applying masking tape to paper aprons by hand and handling separately the paper and the masking tape roll. Thus, with the operation of applying masking tape to the edges of the masking paper apron now performed automatically by means of either the Permacel Masker or the "Scotch" brand Apron Taper, automotive refinishers can work better and faster.[2]

Sealing duct work of heating and ventilating systems represents another interesting job where masking tape proves helpful. In one West Coast commercial construction project recently, joints were effectively and permanently tape-sealed, and the whole job was completed in a mere fraction of the time that would have been required for the messy and uncertain application (sometimes employed on similar jobs) of strips of paper dipped in cement. Tapes used in this application were Permacel 77 Paper Masking Tape and Permacel 66 Cloth Masking Tape—the latter employed mainly to hold and seal the aircell (corrugated asbestos paper) wrappings on the insulated portions of the duct work.

Aircraft producers, parts manufacturers, and transport companies, like their respective counterparts in the automotive industry, put masking tapes to many uses in the interest of speeding up production or expediting essential maintenance and servicing. For example, when a Pan American World Airways Clipper is withdrawn from active service and put in the hangar for major overhaul, protective masking tape is used to protect much of its equipment. This cloth-backed tape is impregnated with a plastic

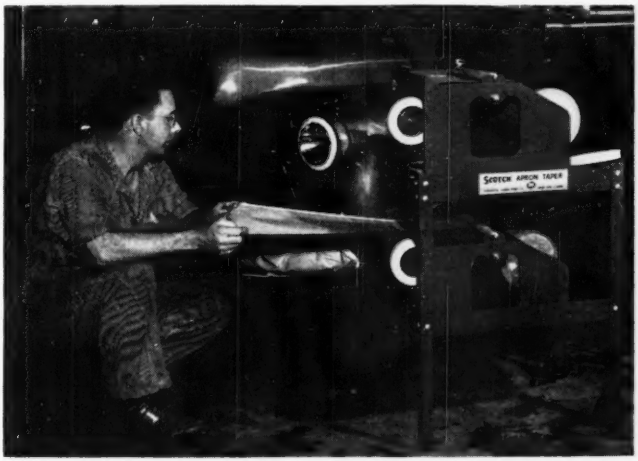

Fig. 3—Among the newest developments in masking "tools" designed to help auto repaint shops simplify and speed up masking and finishing is the "Scotch" brand Apron Taper, a portable device developed to dispense taped aprons of masking paper ready for instant application. Here, painter pulls off a narrower width from bottom shelf. Tape is automatically applied to edge of paper as he pulls it from Apron Taper. (*Photo courtesy Minnesota Mining & Mfg. Co., St. Paul, Minn.*)

Fig. 4—Pressure-sensitive tape protects rubber edge of aircraft domes at Swedlow Plastics Co., Los Angeles, Calif. Shown here is workman (left) applying Bauer & Black Polyken Industrial Tape No. 201 to rubber strip which will finish edge of a B-29 plastic dome. Workman at right is inspecting a dome with tape-covered rubber lip cemented and clamped in place. *(Photo courtesy Bauer & Black Division of The Kendall Co., Chicago, Ill.)*

composition which keeps moisture out. When applied over aircraft openings such as the pitot tube, exhaust manifold or propeller shaft, the delicate instruments and motor parts inside are safeguarded from injurious substances such as dirt, fumes or humidity. Windows of the planes are also covered by masking tape to shut out the sun's bleaching rays, which would discolor the Clipper's upholstery.

Clipper propeller blades are serviced regularly to strict CCA regulations, and even stricter standards, by Pan American's maintenance department itself. So exacting are these requirements, in fact, that a 435-lb. propeller is turned by the weight of a cigarette to test its balance! Final step in propeller reconditioning is to spray the blade with a de-icing compound. Here, 1-inch wide masking tape speeds the process (see article heading). To ensure a clean, sharp de-icing strip on the blade, a long piece of tape is applied running back to the hub. After the de-icing spray has been applied, a spotless job results as the tape strips off easily while leaving no trace of residue. The same tape is also used to secure the aircraft serial and identification plate stencil on the propeller.

Masking tape helped a manufacturer of aircraft domes solve an unusual fabricating problem. The rubber lip which seals a B-29 plaster dome tight against the top of its ship is as difficult to apply as it is vital to the safety of the plane's occupants. In order to finish and make air-tight the bottom of the dome, a protruding edge of rubber must be attached under pressure, cemented and heat-sealed in place. This rubber lip must be protected throughout the operation, for any slight damage would seriously impair its efficiency.

Swedlow Plastics Co., Los Angeles, Cal., found that Polyken Industrial Tape No. 201 could be used effectively to guard the edge of rubber. A strip of rubber is covered, top-side, with the tape, which has the qualities of adhesion and abrasion-resistance necessary to stand up under the strain of the entire operation (see Fig. 4). Tape-coated rubber strip is then cemented to the edge of the upturned dome, clamped with dozens of heavy clamps, and heat-sealed for lasting connection. Because of its high solvent and heat resistance, Bauer & Black Tape No. 201 withstands the heat and the cement "curing" process as well as

the grinding pressure of the many necessary clamps, After application, Tape No. 201 strips off clean, leaving the rubber edge unmarred.

Consolidated Vultee Aircraft Corporation, one of the nation's largest airplane manufacturers, has been using Mystik Paper Masking Tape for some time in its painting and finishing departments on color-separation painting operations as well as for masking-off parts and sections to protect them against paint spray. The company also uses this tape to protect certain parts of the equipment during storage.

Paper masking tape also finds wide use as a stencil in spray-painting names, numbers, insignia, and other designations on railway cars, buses, aircraft, boats, and countless other surfaces. For example, at the Pullman Company's Calumet Shops on Chicago's south side, masking tape facilitates application of lettering to exteriors of sleepers of such streamlined trains as the "City of San Francisco" and the "City of Los Angeles," operated jointly by the Chicago & Northwestern, Union Pacific, and Southern Pacific Lines.

The background (or area to be lettered) is first covered with a wide strip of Permacel masking tape, and on this the letters are outlined in chalk, using a master "pounce pattern" as a guide. Letters are then cut out of the tape with a sharp knife, leaving a working stencil that adheres closely to the bright yellow background, so that clean, sharp letters will be formed by subsequent spraying of red paint (see Fig. 5). Masking tape stencil is then stripped off after the red paint has dried. Inside the cars, keeping paint off windows, mirrors, lights, metal fixtures, metal strips, registers, washbasins, and so on, is as much of a problem as applying the finishing material where it is required—and the solution, again, is found in the use of kraft paper and masking tapes.

A leading locomotive manufacturer uses SR 660 "F. O. S.," a general-purpose tape, in a 6-inch width for spraying the numbers on engine cabs. The tape is applied and stencil cut on the job, then paint is sprayed in the voids. Upon removal, a clear definition of the stencil provides an accurate legend.

A coach manufacturer employing infra-red heat for the accelerated dry-

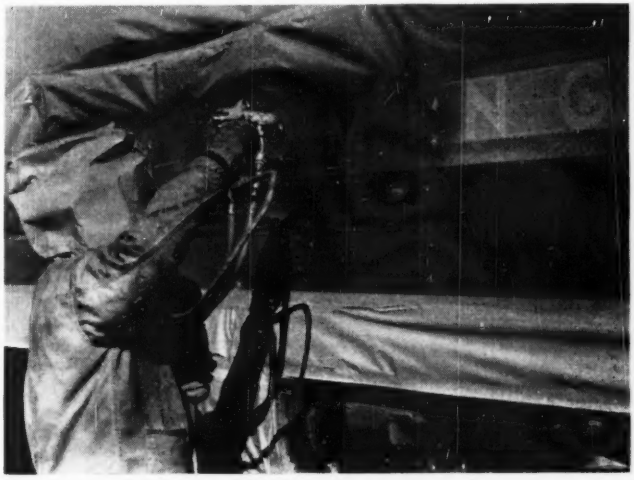

Fig. 5—For all steps required in refinisning both new and old Pullman cars, inside and out in the Pullman Company's Calumet Shops, Chicago, Ill., paper masking tapes are performance - proved "tools" that speed up finishing, save time, cut costs, making possible a better finishing job with less paint. Here the lettered area of a streamlined Pullman car is sprayed with red paint. Tape serves as a stencil for the lettering, and as protective masking of the previously applied yellow. (*Photo courtesy Industrial Tape Corp., New Brunswick, N. J.*)

Fig. 6—Spraying color strip around windows on a 21-passenger airliner in Minneapolis, Minn. shops of Mid-Continent Airlines. Pressure-sensitive tape holds masking paper securely in place, protects against paint overspray.
(Photo courtesy Mid-Continent Airlines, Minneapolis, Minn.)

ing of lacquers, applies this same tape around the window frame in the coach where it of necessity comes in contact with the rubber beading. Inasmuch as pressure-sensitive tapes have a rubber base, the adhesive of ordinary tapes had a tendency to transfer on the rubber frame of the window due to the high-temperature baking operation. The Seamless Rubber Company, however, developed a cloth-back construction with a special heat-resisting adhesive compound that provided the answer to the problem. Paper tape in this instance could not withstand the elevated temperatures involved because of the bond to the rubber resulting from the heat treatment. "F. O. S." High Temperature Tape, designated as SR 612, was developed expressly by Seamless Rubber engineers for the particular operation at hand.

Systematic maintenance of buses keeps them rolling, as any bus fleet operator will tell you. Paint removal is a periodic job that must be handled as quickly and easily as possible. To handle this work, the Maintenance Division Paint Shop of the Chicago Motor Coach Company, which operates 550 buses daily, has a floor area of 200,000 sq. ft., and keeps a 30-man painting crew continuously busy in applying the original coat-of-many-colors to new buses, and in renewing that coating often enough to keep all of the buses looking like new. Each bus is completely repainted, inside and out, every fourth year.

Here, too, as in railroad repair and car shops, the spray gun and masking tape team up to facilitate all painting, including striping and lettering, permitting the application of a succession of colors in a fraction of the time required for brush painting (see Figs. 7 and 8). The spray gun applies the colors quickly and evenly; the masking tape keeps it off adjacent areas that are either to be left unpainted or painted a different color—including windows, headlights, metal and rubber moldings. Stripes are sprayed between two strips of Permacel Flatback Tape; lettering is sprayed through stencils cut out of the same tape. Sharp separation between adjacent colors is ensured by the sharp edges of the masking tape, and by its conformability to concave, convex and other curved surfaces.

Die-cut stencil masks of various sizes and shapes, made of pressure-sensitive tape or paper, are widely used for the speedy, accurate application of insignias, trademarks, trade names, decorative borders, and patterns, many of them being reproduced in two or more colors. Exemplifying this type mask is one product known as "Mystik Self-Stik Spra-Mask," which combines the accuracy and beauty of hand lettering, the speed of stenciling, and the application ease and economy of spray-painting.

Manufactured by Mystik Adhesive

Products, Chicago, Ill., Spra-Mask is used by Studebaker, Boeing Aircraft, International Harvester. Willys-Overland, Diamond-T, Saginaw Tool & Machine Works and many other manufacturers for die-cut masking in decorative painting, and for protective masking against damage. This material is sturdy kraft, impregnated on the back with pressure-sensitive adhesive, which is protected until ready for use by a creped paper covering that is stripped off easily and quickly in one operation.[3]

Masking with this material is simple, fast, accurate. Spra-Mask is placed into position and pressed firmly. Then, ties are removed with a sharp knife. Paint is applied by spray gun or brush, after which the mask is peeled off clean without marring or leaving a residue on the finish. With letter ties removed before painting, complete and unbroken finished designs and letters are obtained. Reproductions secured not only match the finest hand-lettered jobs, but also cost considerably less. And the work is done far faster, too![3]

Mystik Spra-Mask is supplied ready-to-use, die-cut to user's specifications. Or, the user can cut his own stencils from blank stock, which is die-cut at the factory to any size or shape. Standard rolls of blank stock are 36 inches wide by 60 yards long, with other widths and lengths available on request.

Use of pre-cut stencils is a definitely growing practice, however, since it offers optimum opportunities to save time and to cut cost of applying lettering, decorative designs and so on "to the bone." One national operator of heavy equipment (tractors, trucks, and so on), it is reported, saves many

Fig. 8 (below)—Here's the CMC coach after refinishing, with masking paper and tape in process of removal. When the last color has dried, the Permacel masking tape strips off as easily and quickly as it went on, leaving no residue on painted surfaces. Note tape stencil through which lettering has been sprayed. *(Photos courtesy Industrial Tape Corp., New Brunswick, N. J.)*

Fig. 7 (above)—In CMC's Maintenance Division Paint Shop, the spray gun and masking tape, working together, simplify and facilitate bus refinishing. Here, bus is completely masked with paper and Permacel Tape, ready for application of sprayed stripes and lettering—the latter sprayed through a tape stencil.

Fig. 9—Stainless steel is protected against stains by what producers put in the sheet—and against scratches by protective paper they put on it. In one Eastern rolling mill, scratching or marring of highly finished surfaces of stainless steel sheets is easily avoided through the use of "oversize" Permacel Protective Paper which, with adhesive coating on the under side, is applied just as it comes from the 36-inch roll and brushed into contact with the steel sheet. Overlapping margins are trimmed off to ensure full coverage with flush edges. *(Photo courtesy Industrial Tape Corp., New Brunswick, N. J.)*

thousands of dollars in lettering serial numbers on equipment with special Spra-Mask stencils produced by a war-developed-and-proved process, which enables the manufacturer, Mystik Adhesive Products, to automatically cut these numbers on presses.

Another widely used material for producing sprayed lettering and designs, particularly on transportation equipment of all types,[4] is the "Stickibak Ready-Cut Paper Mask," made by C. O. Dicks Co., Detroit, Mich. This mask, with a removable liner, is unusual in that it is a "two-in-one" product designed for double duty—that is, it may be used either before or after the surface to be masked receives its final color coat. In other words, if it is desired to apply letters or numbers before final painting, the lettering or numbering color is spotted on and covered with letters or numbers from the center of the mask; if letters or numbers are applied after painting the base surface, mask centers are removed and used as background to paint through.[4]

Relettering railroad coaches is one of the most common applications[5] of the Stickibak Mask. New York Central, B & O, Santa Fe, Frisco, Missouri Pacific, Reading, Great Northern, Seaboard and the C & O are among the leading lines using the Stickibak Mask lettering system. After surface to be lettered has been properly cleaned, the crepe paper liner is removed from the mask to expose its adhesive. Then the mask is placed carefully into position, using as guides a vertical and a horizontal line previously drawn over the surface where the mask is to be used. When the mask has been slid and adjusted as desired until located in proper position, it is "sealed" to the surface by placing a plain piece of paper (not newsprint) over top of mask and rubbing vigorously with a dry, stiff fibre bristle hand brush.

Next, ties holding letter centers in position are cut and removed with a sharp knife or razor blade, using care not to cut through the underlying paint finish. Mask is then given a final rubdown to seal edges of letters. Spraying of lettering color follows, succeeding thin wet coats to produce sharp edges being applied. Sufficient time is allowed between coats for color to set.

The Stickibak Mask can be removed any time after spraying. If spraying lacquer, mask must be removed care-

fully while color is wet; when enamel is used, the mask is removed after the color has set. Letter centers are then removed by carefully picking them out, using a sharp-pointed knife. The final, durable result is sharp, clean letters made possible by proper sealing of edges when spraying or brushing. Marks left by ties—common to ordinary stencils—are absent.[5]

Irregular surfaces can be lettered with this method easily and quickly. Compound curves, rivet heads and raised bands or straps present no serious obstacles. Stickibak pressure-sensitive paper with protective liner also can be die-cut into special shapes for use as a protective covering on industrial parts to guard them against surface damage during production. Another use is as a resistant for etching with sandblast.[4] Dicks also produces a "Graybak Pap-R-Mask" which, used in conjunction with a special liquid adhesive, finds extensive application among bus and truck fleet operators for sprayed lettering and name identification purposes.[6]

Keeping stainless steel sheets stainless and scratchless—and similarly protecting other polished metals, plastics and like fine surfaces—against damage during fabrication, shipment and storage is a masking job that has become increasingly important in recent years to both rolling mills and fabricators. For this work, pressure-sensitive adhesive papers are widely used.[7] Among typical examples are "Mystik Self-Stick Protecto-Mask," made by Mystik Adhesive Products; "Permacel Protective Paper," made

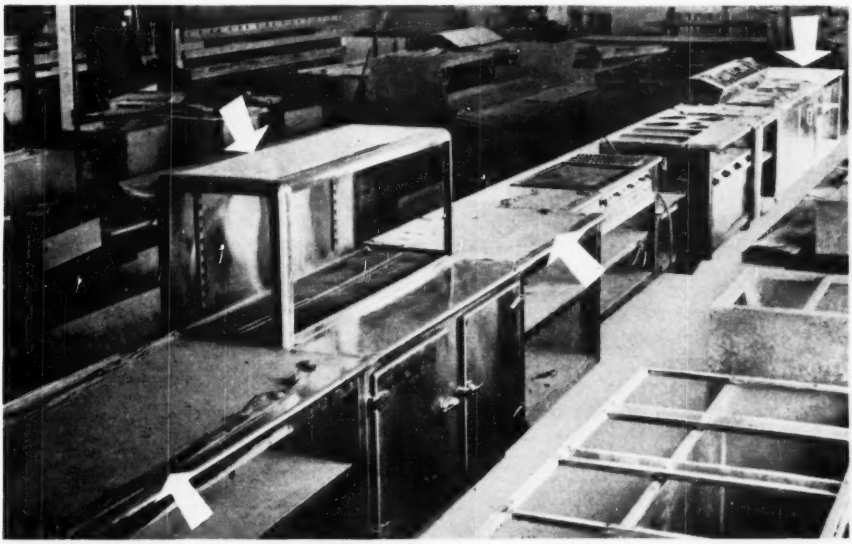

Fig. 10—Positive protection of all highly polished materials against abrasive damage during fabrication is secured by the Reho Co., Los Angeles, Calif., producer of equipment for restaurants, bars, hotels, drug stores, and dairies, through the use of Mystik Protecto-Mask, which is applied to the flat sheets of steel, remaining on them until fabrication is completed. As steel sheets are fed through forming dies, Protecto-Mask prevents dies from damaging highly polished surface of steel. In welding, riveting, or bolting joints together, paper is pulled back from the edges to provide a working surface, but is permitted to remain on the rest of the sheet, thereby protecting most of the surface.
(Photo courtesy Mystik Adhesive Products, Chicago, Ill.)

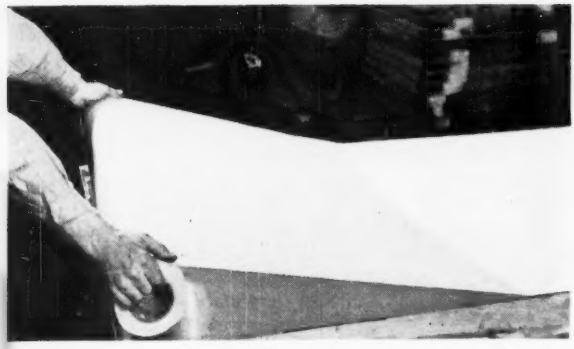

Fig. 11—Application of Mystik Protecto-Mask to polished stainless steel sheets from roll, by hand, in fabricating plant of Mojonnier Bros., Chicago, Ill., manufacturer of food processing equipment. Tape is fed from a simple stand that supports the roll on a rod or pipe just above the table, in another method of application in which steel passes across the table and Protecto-Mask is roll-fed directly to sheets in one simple operation. (*Photo courtesy Mystik Adhesive Products, Chicago, Ill.*)

by Industrial Tape Corporation; and "Scotch" brand No-Mar Protective Tape, made by Minnesota Mining and Manufacturing Company.

Proper masking of polished metal sheets not only provides them with positive protection against mechanical abrasion and damage to eliminate costly repolishing or refinishing, but also simplifies and speeds up their handling. In fabrication, for example, protective masking with an adhesive paper safeguards the surface against scratches, gouges, oil marks, stains, etc.; provides a cushion against blows from dropped tools or falling objects; prevents abrasive damage from piling or stacking sheets on tables where grit accumulates; affords a shield against spatter from welding arc; prevents marring of surface by forming dies, and other tools.[5]

The latter feature is of particular interest. Experience demonstrates that masking papers such as those cited do not interfere with shearing, punching, drilling, stamping, bending or shallow drawing operations; hence, they generally are left in place on the surface to continue exercising their protective function, sometimes right up to the time when fabricated sections are set up in final installations.

Equally important, fabrication is frequently facilitated also by the fact that paper-protected plastics or metals can be plainly marked with any numbers, symbols, or instructions that may be required in pen, pencil or crayon. Or, drawing layouts, diagrams, and so on, can be sketched, without broken lines or imperfections, directly upon the smooth, even paper surface of the sheets that are to be processed. This convenience adds nothing to the cost of the protection provided by this masking method, but does add consideraby to its value from the time-and-labor-saving standpoints. When the protection is no longer needed, the paper peels off simply and quickly—in one piece and without tearing—leaving the polished surface in the same sparkling condition as before, so that there is no necessity for a "clean-up," repolishing or refinishing operation.[7, 8]

A mask of this type is essentially the same as pressure-sensitive tape except that it is wider, and its adhesion is lighter. It is available in rolls up to 38 inches wide by 60 yards long to meet the requirements of both producers and fabricators of sheet metals. Its adhesion is lighter than tape since large areas of contact make strong adherence unnecessary.

Protective masking paper is applied directly to finished sheet metal surfaces, just as it comes from the roll. It adheres instantly on contact, requiring no moistening. Time, labor, space

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and expense are saved as this type paper requires the use of no equipment other than a convenient table or trestle. Nor is any drying time involved. As soon as the paper mask is applied, the sheets can be piled on a truck, ready for removal to stock fabricator with the same unblemished surfaces that they had upon emergence from the polishing machines.

Indicative of the savings possible in handling stainless steel sheets by the paper masking method is the experience of the Butler, Pa., plant of American Rolling Mills (see Fig. 9). Until recently, the most common method of protecting sheets against damage here was that of spraying with a protective coating. Each sprayed sheet required a drying time of from 15 to 60 minutes.

This meant, of course, a waiting time during which the sheets had to remain spread out, since they could not be piled up until the protective coatings were completely dry. Now, through the use of Permacel Protective Paper, a protective material and method that provides adequate, easily-applied protection has been secured. The excessive use of floor space formerly entailed has been eliminated.

Paper masking also has proved the answer to the problem of protecting highly polished materials at The Reho Company, Los Angeles, Calif., manufacturer of stainless steel equipment for restaurants, bars, hotels, drug stores and dairies (see Fig. 10). In this plant, Mystik Self-Stik Protecto-Mask is applied to steel sheets and remains in place until fabrication is completed. As sheets are fed through forming dies, Protecto-Mask prevents dies from damaging steel surfaces by reason of its strength and elasticity. When joints are welded, riveted or bolted together, Protecto-Mask is pulled back from the edges to provide a working surface.

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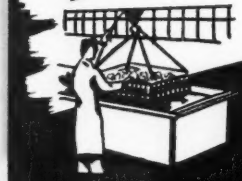

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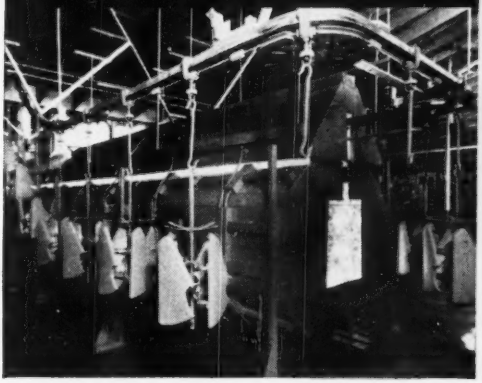

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In the manufacture of stainless steel food processing vats, seams are all welded, the welds ground down very smooth and then buffed to a high luster and smooth finish. At the plant of Mojonnier Bros., Chicago, Ill., Protecto-Mask is used to protect polished stainless steel sheets during fabrication. The mask, applied directly from the roll by hand, as shown in Fig. 11, protects tanks and vats while various finishing operations are being completed.

Still another plant where Mystik Protecto-Mask provides desired protection of stainless steel sheets during storage, handling and frabrication is at the American Nickeloid Co., Peru, Ill. But one of the most interesting and unusual applications of this product in the entire finishing field, perhaps, is to be found in the production of electric kitchen clocks, which have a plastic case with the front transparent to form the cover for the clock face. This is easily scratched unless handled with extreme care; if not sufficiently protected, the clock face may reach the consumer in a scratched, marred condition. Protecto-Mask supplies a simple solution to the problem. By precutting Protecto-Mask circles to fit the face of the clock, the manufacturer protects this transparent section easily and dependably, thereby ensuring shipment of a scratch-free, marfree product from producer to wholesaler to retailer to consumer.

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Mystik Adhesive Products
Chicago, Ill.

Robert Spector Co.
New York, N. Y.

The Seamless Rubber Company
Industrial Tape Division
New Haven, Conn.

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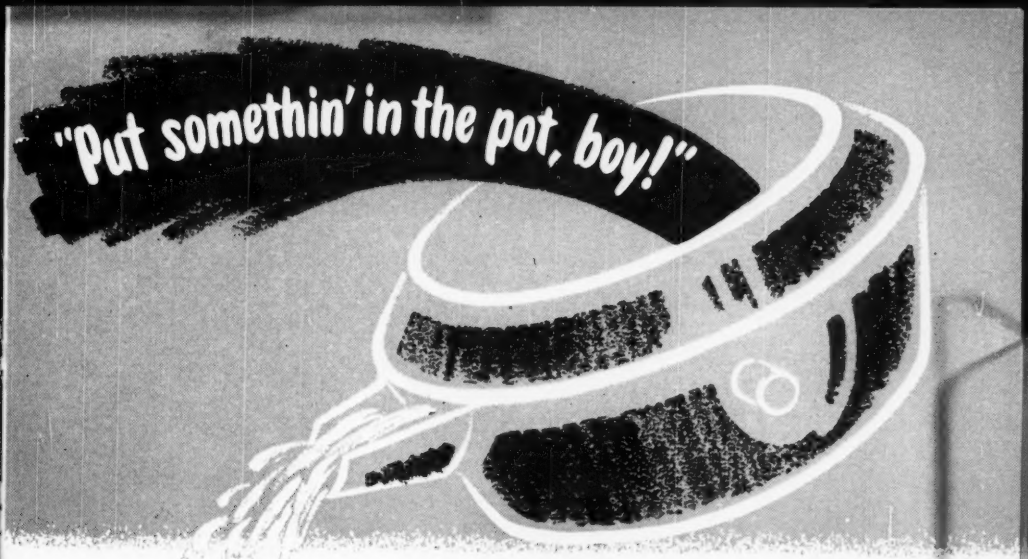

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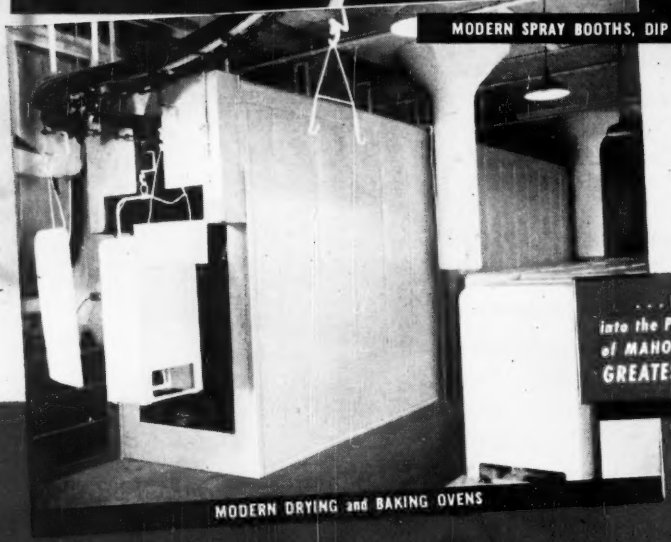

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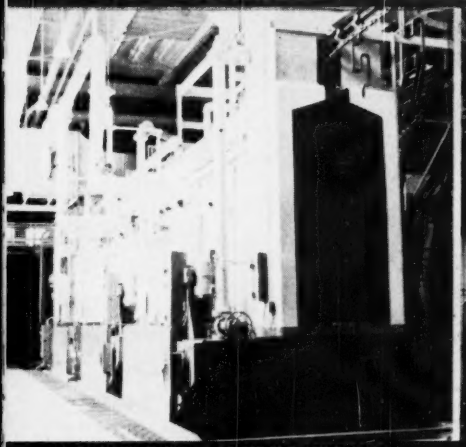

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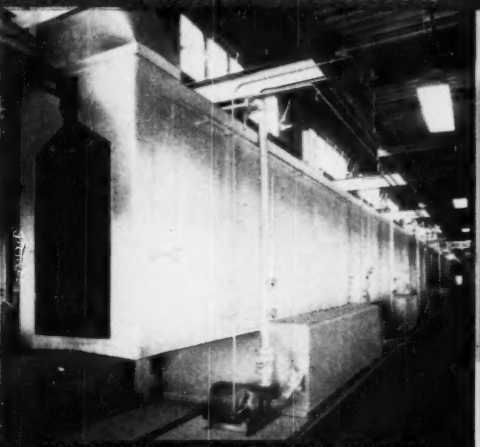

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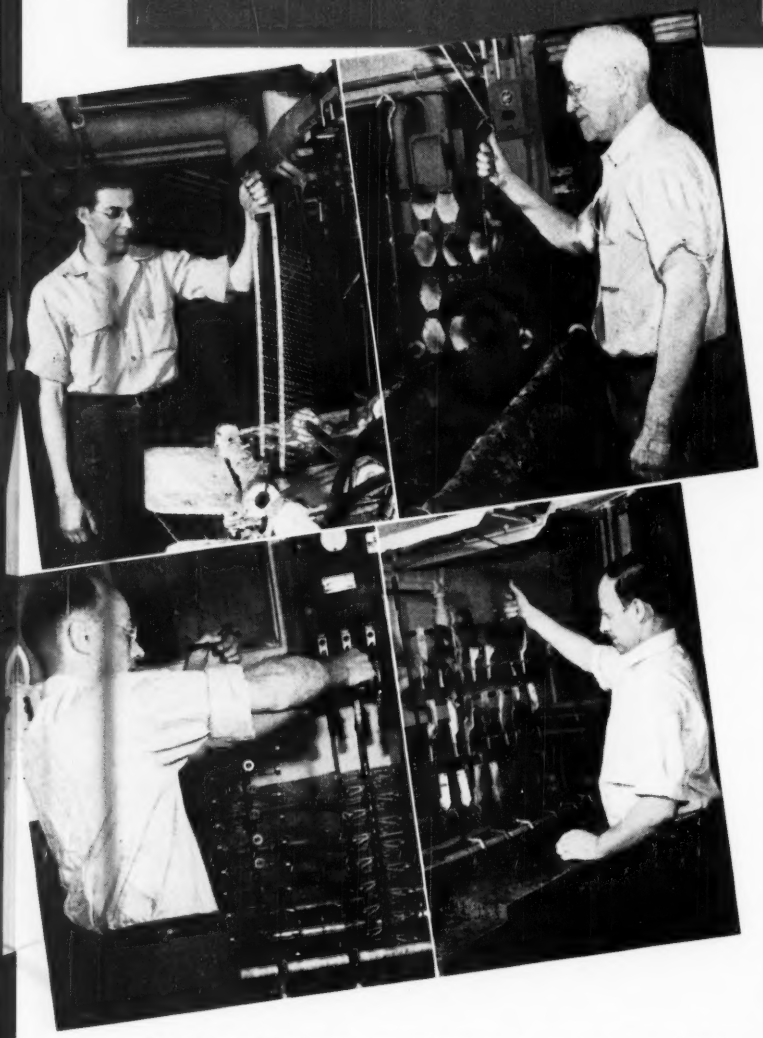


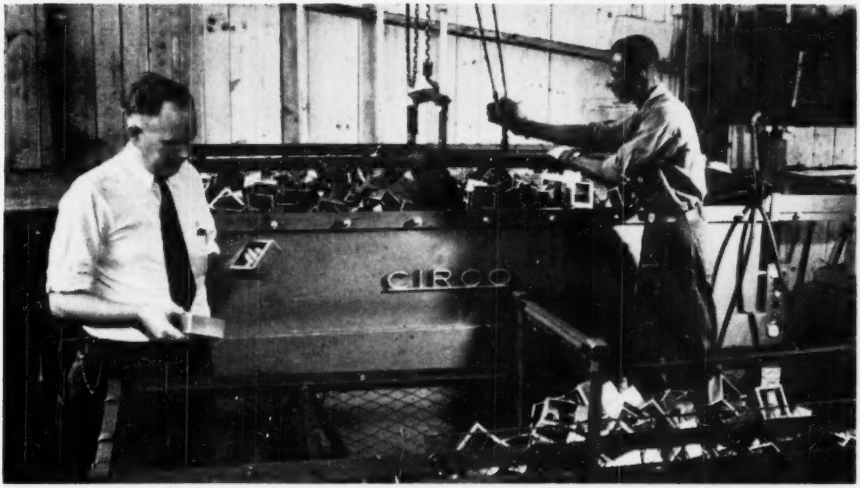
Plating Racks

Many small parts for fluid duplicators and mailing machines are nickel and chromium plated. As the volume of production of these parts increased, the value of designing special plating racks to use instead of the former method of stringing the parts on wires became obvious. Some of the plating racks designed by plating room personnel are here illustrated.

The photograph above, left, shows a rack for plating bottle tie rods being placed in a plating tank by Louis Reczek, plating apprentice. Upper right, Jerry Nihan, chief plater, places a special rack for fluid bottle tops into the bright nickel tank. Lower left, Herb Wenham, supervisor, is shown in the act of copper flashing 1½ inch O.D., ½ inch I.D. collars shown mounted on specially designed racks. Lower right, Joe Bernard, plating room assistant, places a special rack of envelope tension springs for sealing machines in the chromium plating tank.

In all cases, the thought and effort expended in the development of these plating racks resulted in improved productivity and improved quality of plating.

This information was submitted for publication in PRODUCTS FINISHING by D. P. Hoover, vice president, Standard Duplicating Machines Corporation, Everett 49, Massachusetts.



Courtesy of Bud Radio, Inc.

Save—with Circo Vapor Degreasing

Circo vapor degreasing quickly and easily removes oil, grease and dirt from recesses and holes in even the most intricate parts. Circo degreasers handle all types of work —tiny screws or large iron castings —prior to finishing, inspection and assembly. High precision standards are safely met by Circo degreasers.

With a Circo degreaser, not only do you get better cleaning faster, but you are assured of operating economy. Its automatic control system holds solvent consumption to a minimum. Costly hand-labor operations are eliminated—savings of over 90% in time alone are common.

Send for our catalog of standard Circo degreasers. Our engineers will gladly work with you on unusual problems requiring equipment of special design. A-3302

Cut costs 3 ways:

1. **Minimum solvent consumption.**
2. **Reduced man hours.**
3. **Better cleaning faster.**

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Metal Cleaning Equipment

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PIONEERS IN THE DEVELOPMENT OF HOT VAPOR CLEANING EQUIPMENT

These multi-color Rheemcote drums reveal the authenticity of trade mark reproduction which the new Rheem process makes possible for the first time on 55-gallon steel drums. The Shell drum at left is in familiar red and cream; Sinclair drum is in red, white, and green; special Rheem drum is a first sample of new process in red, white, and blue; unlabeled drum at rear is orange and black; RPM Diesel lubricant drum is in red, white, and black; and Richfield drum at far right is blue on white.

Color Lithography Process for Large Steel Drums

INTRODUCTION of multi-color lithography to the exterior of 55-gallon steel drums, opening new avenues in packaging and merchandising of oils, chemicals, foods and other products, has been announced by the Rheem Manufacturing Company, world's leading producer of steel shipping containers.

Veteran steel container men describe the new process, known as Rheemcote, as the first major improvement in this field in 25 years. Details of the new development, which represents an initial company investment of more than a million dollars, have been described by President R. S. Rheem. Vital steps in the new manufacturing process are pictured in the accompanying illustrations.

The advent of Rheemcote follows several years of research, in which Rheem engineers collaborated with a manufacturer of large lithograph presses. A specially designed press was developed which handles large sheets of heavy-gauge steel as a conventional press handles paper.

Users of large steel containers now can introduce in two to four colors their brand-name, trade marks and other packaging information to containers of all sizes and in detail as fine as on paper, thus ensuring consistency in package design and labeling, from the smallest can or pail up through the 55-gallon drum.

"Rheem customers who already have used or seen the Rheemcote drum are enthusiastic over its ability to carry

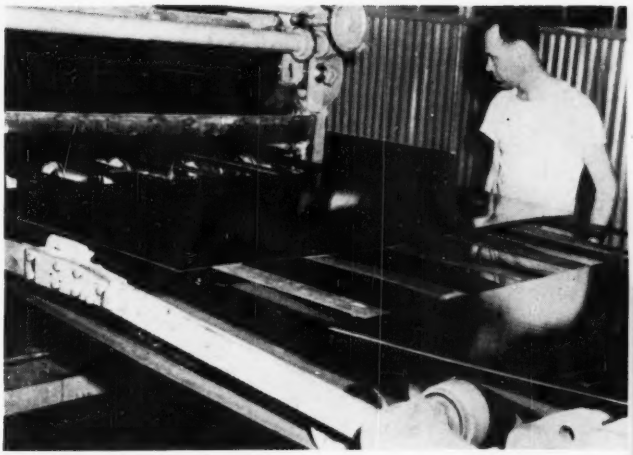


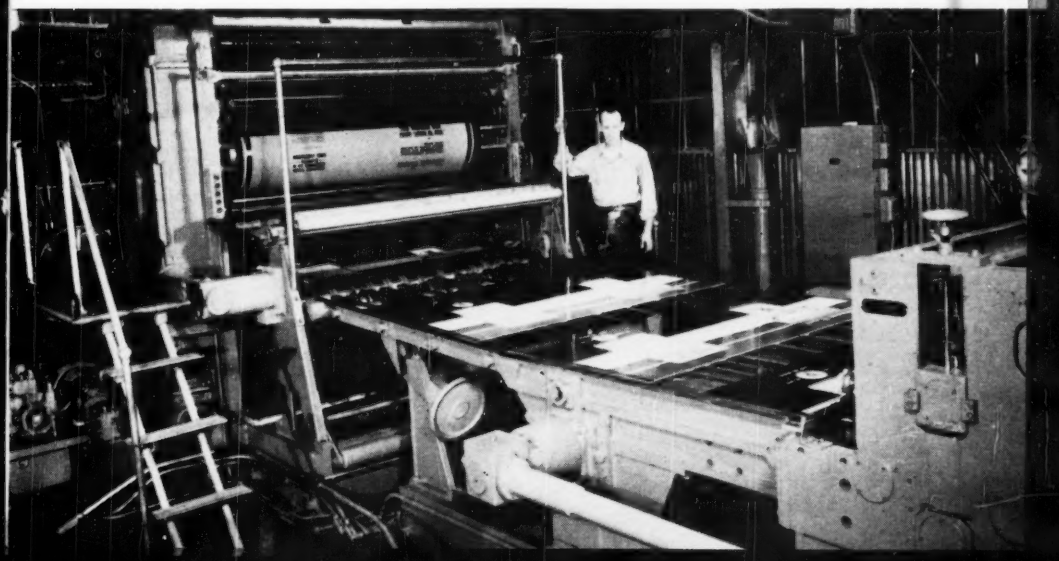
Fig. 1—Roller coater applies base coat to steel sheets which will become Rheemcote drums; also coats uniform, controlled thickness lining on inner side. Coated sheets are picked up by oven conveyor, out of picture at right, and preheated, baked, and cooled.

their brand names, trade marks, slogans, in full, distinctive color, throughout the United Staes and to the farflung ports of the world," Mr. Rheem said.

Along with the development of the special multi-color metal lithograph presses, Rheem has created and adapted special machinery which forms and welds the flat lithographed steel sheets into drums without marring or burning the glistening surface.

Another integral part of the Rheemcote process, which is fully protected by process patent applications, is a new method of coating drum interiors with non-corrosive and sanitary linings, permitting bulk shipment of corrosive fluids and foods with utmost safety. Perfectly uniform linings, con-

Fig. 2—The world's largest metal lithography press, integral part of a new Rheem Manufacturing Company development, handles large sheets of heavy gauge steel like paper. Large 55-gallon steel drums now can be lithographed in two or more colors, including brand names, trade marks, and other packaging information.



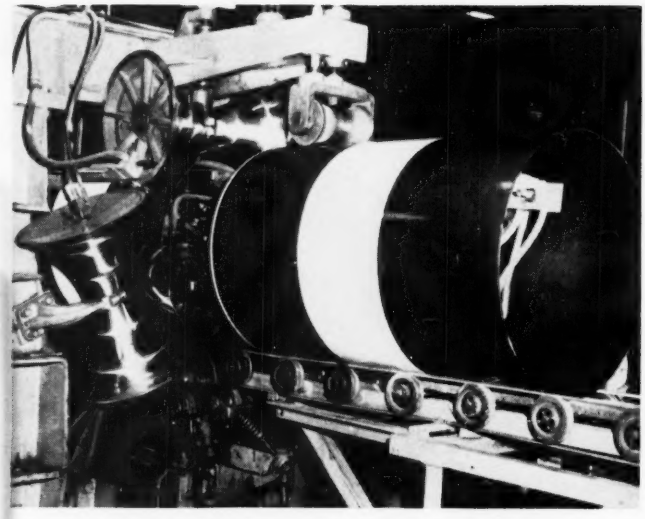


Fig. 3—Electric resistance lap welder forms weld at seam of Rheemcote drum free from scale and without burning already lithographed finish or lining of drum. Polished "hour glass" rolls hold drum to perfect circular cross section for welding, do not mar finish.

trollable in thickness to a thousandth of an inch, are roller-coated on flat steel sheets before the drums are formed, providing an inner protective coating free from scale and the variation in thickness common to sprayed linings.

Although lithography on smaller metal containers—pails and small cans—has been commonplace for years, the Rheemcote process, developed and in operation at the company's New Orleans plant, for the first time makes possible similar treatment with absolute precision of steel sheets large enough to fabricate full-size drums. The press lithographs three by six-foot sheets of 18-gauge steel at

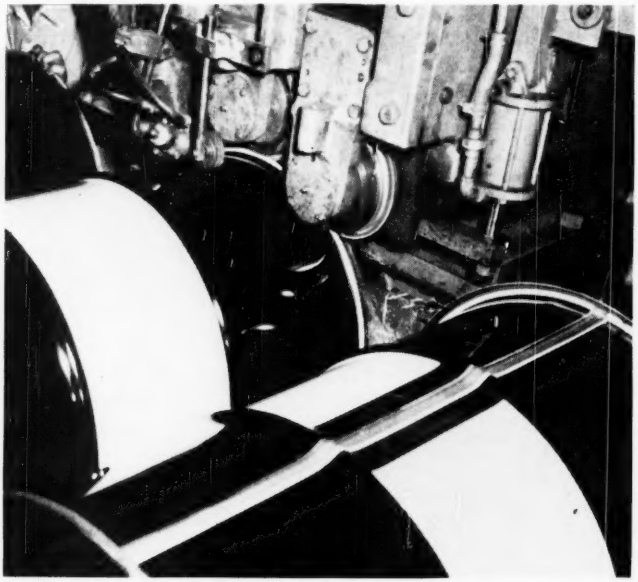


Fig. 4—Double seamer, specially modified to protect lithographed Rheemcote finish, turns rim of drum head down over flange of shell, then doubles seam back on itself, forming airtight double seam. Seamer chucks have been faced with rubber, are started and stopped with each cycle.

Service . . .

the *Randolph* way

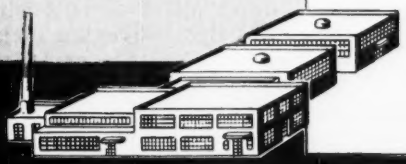
Recently the Randolph four-passenger Piper returned from a seven-day, 3,000-mile trip. On it were top Randolph executives completing a heavy schedule of appointments that took them from Tennessee to Illinois, talking to industrialists and business men, visiting plants and offices, concentrating on methods through which Randolph lacquers, enamels, and synthetic finishing products could best serve the needs of this vital part of the country.

This trip is typical of the steadfast policy of the Randolph Products Company to understand at first hand the finishing problems of its customers. It is an important aspect of Randolph service, experience and research, brilliantly keynoted by its modern laboratories staffed by outstanding technicians. The result is keen know-how in step with every need of 20th century enterprise for special types of undercoats, television finishes, aircraft finishes, dopes, thinners, highly specialized production finishes, office equipment finishes.

However rigid the specifications, whatever emergency situation presents itself, Randolph customers know that here is an organization splendidly equipped to provide answers—and the right surface materials.

INQUIRIES INVITED

Write, wire or phone us if you have any finishing problems. Our able technicians offer skilled help—without obligation to you, of course.



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PRODUCTS COMPANY
CARLSTADT, NEW JERSEY

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a rate of 4,200 sheets—more than 75 tons—per hour.

As Rheem executives contemplated samples of the new Rheemcote drum

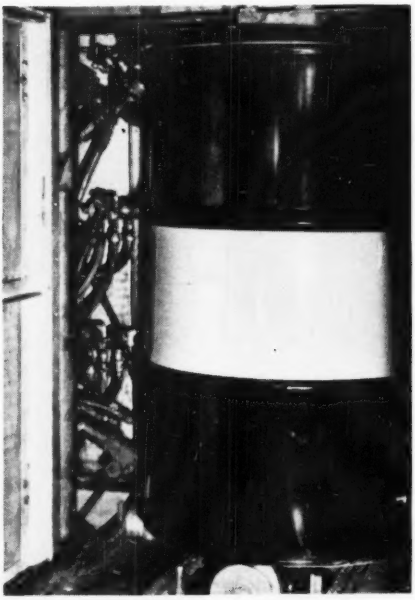

Fig. 5—Special chime-sprayer was developed by Rheem engineers to coat chime or bead at top and bottom of drum with same color used on side. Double seaming head and bottom onto drum shell left rim of contrasting color at each end of drum. Nozzles at left coat chimes with special air-dry mixture of roller coating compound, while drum spins at high speed in small spray booth.

and estimated first delivery dates, they realized that production would be rolling by the firm's 25th anniversary this year.

The history of this company dates back to June 20, 1925, when the Rheem brothers, Dick, Don and Bill, established a small job galvanizing shop in a wooden shed near San Francisco Bay. An early steel drum galvanizing contract led to the formation the following year of Rheem Manufacturing Company to fabricate drums and steel containers.

The young company began to thrive despite a couple of ruinous price wars and in the face of the great depression. They expanded to Los Angeles and Houston, added water heaters to their line, and established an Australian subsidiary.

By 1940, after 15 challenging years, Rheem was doing a ten million dollar annual business, and had become the leading manufacturer of steel drums in the United States. In the following year the company became the nation's leading manufacturer of household water heaters.

At the close of the war, with 20 plants operating in the U. S. and Australia and fulfilled war contracts in the neighborhood of 200 millions behind them, their net sales in the U. S. alone approximated ten millions a month.

In re-converting from war production, Rheem switched from the special operations which had turned out bombs and shells and ship and aircraft assemblies to its normal output—steel drums and pails, and water heaters and related heavy household appliances. The company's regular products had, of course, been produced in great volume throughout the war to fulfill military requirements.

Today, the brothers can look back on 25 years which have brought the earnings of their company from scratch to more than two and a half millions last year. Their facilities have grown from a shed on a weed lot to a prosperous seven U. S. and nine foreign plants. They were the first steel drum manufacturers to succeed in becoming national by de-centralizing, and they bucked the traditions of business expansion by expanding from West to East, right through a major depression.

Rheem marks its silver anniversary confidently with perfection of the

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Fig. 6—Air test equipment near end of Rheemcote fabrication line is automatic, was specially designed by Rheem engineers to fill drum with compressed air, eject it after operator flows jet of water down seam to detect leaks. (*All photos courtesy Rheem Manufacturing Co., New York 22, N. Y.*)

Rheemcote process, which hands to the tough, economical steel drum an additional job as the world's newest multi-color advertising medium.

Electrolytic tinplate has largely replaced hot-dip in packaging in the food-canning field. Last year it captured a large share of the market for beer containers and is now being used for 12-ounce cans by the soft-drink industry, the American Electroplaters' Society reports.

PRETTY PILOT PICKS UP PUMP WITH PLATER'S PRIVATE PLANE

Miss Rose Van der Horst, petite pig-tailed blond from Hilversum, Holland, is the daughter of H. Van der Horst, president of Van der Horst Corporation in Olean, N. Y. She has been piloting in this country for three years, with a total of more than 500 flying hours, and is a member of Aircraft Owners & Pilot Association.

Thursday, Mr. Van der Horst decided he needed a Worthington Chemical Pump for experimental plating solutions. Photo shows Miss Van der Horst receiving chemical pump at Newark Airport from Fred Waite, Sales Engineer, Worthington Pump and Machinery Corporation. Friday the pump was installed and running at Olean.

Thanks to *Flock* Surfacing

BOTH SIDES

this Car Window Clothes Bracket* won't Scratch or Slip!

Inexpensive sprayed-on surfacing of Flock does away with the need for vacuum cups, rubber shields or any other type of cost-adding attachments. Bracket slips over top of car window glass—holds snugly and smoothly—won't mar, slide or scratch. Here the use of flock surfacing did much in giving the product immediate market acceptance!

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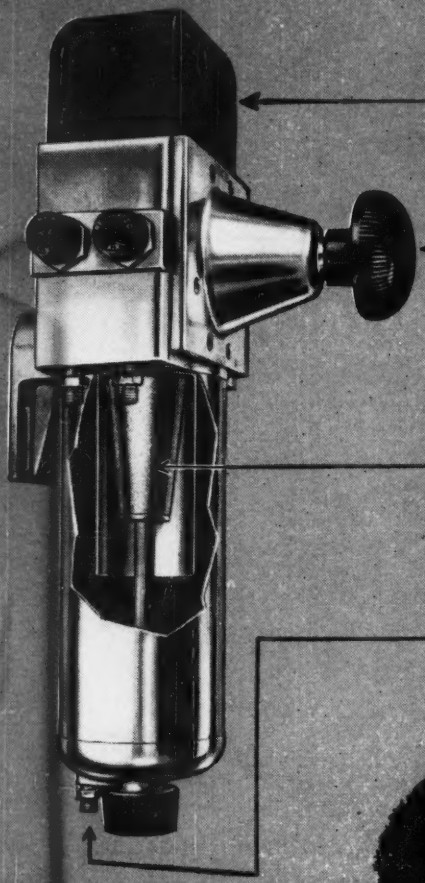
INQUIRIES INVITED

• Claremont Flock is available in bulk, in colors, in quantity for special spraying-on finishing purposes. Write for samples, color charts, prices.

*Flock processing by Suedo Finishing Company, New York City

CLAREMONT WASTE MFG. CO.

CLAREMONT, NEW HAMPSHIRE



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Large, easy-to-adjust, molded regulator knob. Selected pressure is accurately maintained.

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Convenient semi-automatic drainage with valve for optional manual use.

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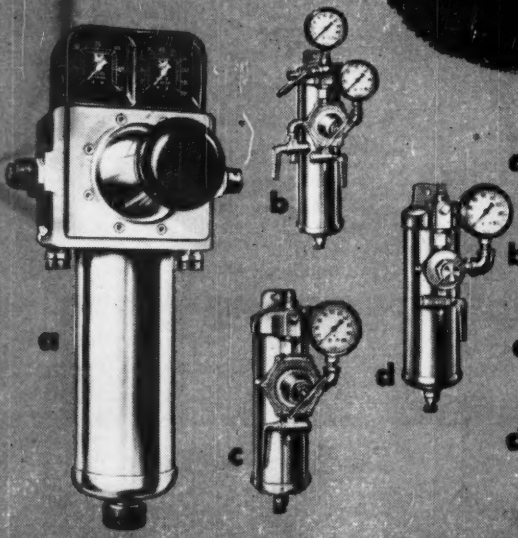

a Model E75 Extractor—Ample capacity to operate several guns at one time. Supplies 75 cubic feet of clean, dry air per minute.

b Model 538A Extractor—Handles two or three guns at one time. Supplies 35 cubic feet of clean, dry air per minute.

c Model 545A Extractor—An inexpensive extractor furnishing ample clean, dry air for one gun of any model.

d Model AO-100 Extractor—A very inexpensive extractor supplying air for one Model 16, 15, 9, 9A or 8 spray gun.

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Binks oil and water extractors not only supply pure clean air, but do so at the correct, unvarying pressure that you select. You adjust the spray gun but once. With correct pressures, there is no waste of expensive paint...the solvent is not dissipated in excess air but goes onto the surface with the pigment to produce a smooth finish.

A Binks oil and water extractor behind your Binks spray gun is the best and only guarantee of perfect finishing.

Pressure regulators and gauges are available as separate items for use where it is desired to regulate air pressure without cleaning the air.

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Metal-Finishing Industries Join Ohio Valley Pollution Abatement Campaign

By JOHN E. KINNEY
Sanitary Engineer
Ohio River Valley Water Sanitation Commission

METAL-plating industries have added their support to the Ohio River Valley Water Sanitation Commission in its program to expedite pollution-abatement measures in an eight-state area.

This was the result of a recent conference in Cincinnati at which industrial-management representatives explored with the executive committee and staff of the Commission how they might work together to safeguard water resources in the Ohio River basin. The Commission is a regulatory body established in 1948 charged with the responsibility for curbing municipal and industrial waste discharges deleterious to streams.

At the conference with the Commission, thirteen companies engaged in metal-finishing activities with plants located in the basin were invited to acquaint the regulatory body with their waste problems and learned of the objectives of the compact commission. The participating companies were invited on the recommendation of the states signatory to the compact as representing those who have already displayed initiative and leadership required for an industry-wide approach to waste control. Similar exploratory conferences have been conducted by the Commission with other industry groups, notably steel, brine processing, oil field and distillery industries.

Following the conference there was formed the Metal-Finishing Industry Action Committee of the Ohio River Commission. This group with Walter L. Pinner, Manager of Research for Houdaille-Hershey Corporation, as chairman will act as liaison among the industries in the basin and the Commission. At the request of the committee, the author was assigned by the Commission to act as consultant to the group.

To serve the interests of the metal-finishing industry, this committee will act as coordinator of research projects on waste treatment, collect and disseminate information as well as undertake an educational program to orient management on waste disposal problems.

In outlining industry's stake in pollution abatement, Edward J. Cleary, executive director and chief engineer of the Commission, told the committee that there are sound reasons why industry should be concerned with forwarding waste control efforts, quite aside from any moral or legal obligations. He cited: "The opportunity to secure better water supplies at lower cost and thus improve a company's profit position; the possibility of im-

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proving relations at a time when public interest is focused on water use and conservation; and the dissatisfaction of progressive leaders in industry with the tardiness of others who are failing to do their part in stream clean-up and thus are provoking the passage of drastic forms of legislation."

At the conference it was pointed out that the Commission is the coordinating agency for the pollution-control authorities in the eight-state basin area. This responsibility includes the establishment of standards for waste discharges emanating from municipalities and industries. These standards will reflect the degree of treatment required in order to maintain suitable conditions in the streams of the basin.

While methods of treatment for municipal sewage are readily available, it is recognized by the Commission that this is not always true in the case of certain industrial wastes. Therefore, special efforts are needed to develop suitable treatment methods. Obviously this is a responsibility of industry. And the Commission believes that talents displayed by industry in product development will provide solutions for the waste problems it creates.

The Commission is not organized to act as a research agency. It is a regulatory body. But it believes that it can inspire and coordinate research efforts that will aid industry in hastening stream clean-up measures. Industrial representatives feel that they can profit through coordination of skills, resources and interests on mutual problems of waste control. Small companies with limited staffs could benefit particularly through a pooling of efforts.

To the Commission it appears that the waste-control efforts in any industry might be patterned along these lines:

(1) Definition—define the volume and characteristics of waste discharges from each plant.

(2) Research—determine how wastes can be reduced and what might be accomplished in devising economical means of treatment.

(3) Execution—translate the research findings into plant operating practice.

The committee's desire to undertake an educational program to orient management on waste-disposal problems is not to be considered as confining their efforts to large organizations. Explanations by the industrial representatives on plating room practice showed that the need for education in pollution-abatement practice is greatest in the case of the small plating establishments. Unfortunately, some of the latter have no concept of the damage that can be caused by the sudden release of a tank of acid or alkali solution. Others are not careful in their normal operations and thus fail to

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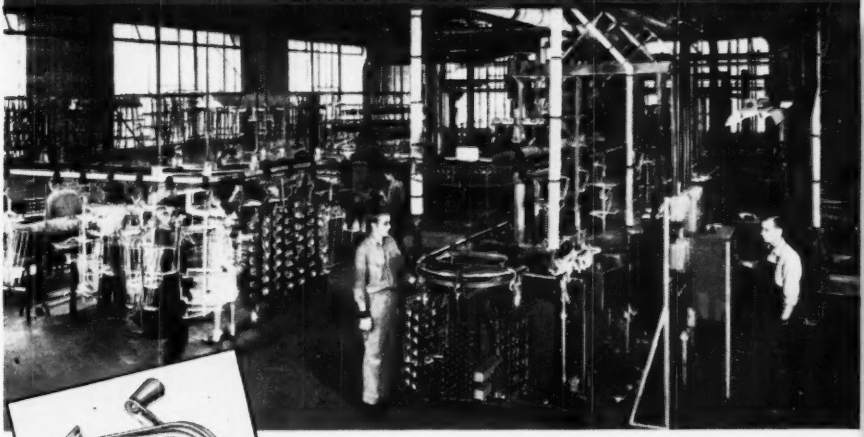
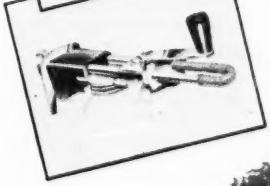
says DAZEY CORPORATION'S PLATING PLANT SUPERINTENDENT





Dazey Corporation, St. Louis kitchen specialty manufacturer, is working around the clock these days. And, according to their president, Mr. William E. Gundelfinger, "We owe no small part of this activity to our Udylite plating installation—the finest equipment in America."

Dazey has two Udylite Full Automatic Plating Machines—one used for nickel plating and one for cadmium, a complete set of Udylite barrels and enough Udylite-Mallory Rectoplaters to provide sufficient current for their operation. Of this equipment, Mr. Dale Bolyard, head of Dazey's plating, polishing and finishing department, reports: "Our Udylite installation saves us 50% in maintenance, has increased production with better quality plating—as well as giving us a big saving in floor space." In addition, Mr. Bolyard has found Udylite equipment is extremely economical to operate.

Udylite equipment can bring these benefits to your operations. Call in your nearby Udylite Technical Man today and have him show you how Udylite can provide greater economy and added profit for your plating plant. Or write direct to The Udylite Corporation, Detroit 11, Michigan. There's no obligation.

THE Udylite CORPORATION

DETROIT 11, MICHIGAN

PIONEER OF [illegible] IN PLATING

realize that many plating-waste problems could be minimized by proper housekeeping procedures.

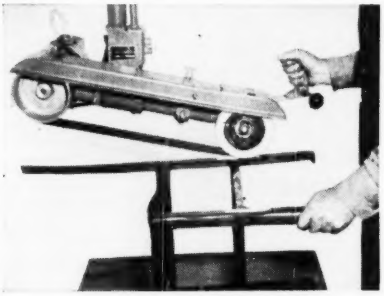
The committee stressed the fact that attitudes of employees on the operation level reflect the attitude of superiors. Consequently, when management is interested in waste control the operator will feel an incentive to do his part.

The committee also noted that top-management's understanding of the problem frequently provides the impetus that results in the use of devices and methods that not only reduce pollution loads but secure economies in production. Examples of this include: (1) installation of level-control devices that prevent loss of a tank of solution when a steam line breaks or a make-up water line is not manually closed at the proper time; (2) installation of fog nozzles that materially reduce the volume of rinse water; (3) installation of filters to allow reuse of solutions; (4) use of first rinse water as make-up water for solutions, thus reducing metal lost; and (5) digging pits below solution tanks, or diking them, to retain solutions when a break occurs.

Reasons were also advanced as to why development of waste-treatment measures has been hindered. There is no association or clearing-house within the electroplating industry primarily concerned with such matters. Neither is there an agency that coordinates efforts by companies searching for methods of treatment. Each company develops its own answers. Unless prodded by special circumstances, management of most companies is reluctant to finance such work alone.

Under the program suggested by the Ohio River Valley Water Sanitation Commission the development of feasible methods of treatment would not be limited to individual companies. Pooling of information and resources pro-

A 100 POUND GIANT NEW AS NEW CAN BE



Never has there been a machine to equal this Marschke Swing Belt Machine for honest-to-goodness "light-weight" grinding and a lot of polishing jobs. Weighs only 100 pounds . . . yet produces a volume of sparks that proves the work it does. What work? For weld seam, spot weld and burr cutting — it's a honey. For removing runs, dirt particles, air bubbles and other finish blemishes — it's a lulu.

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Well balanced . . . maneuverable . . . handy . . . easily manipulated. You ought to see the pictures showing its versatility . . . get the details on this "little giant".

In BURNISHING MATERIALS

THE "PIN" HAS ITS POINTS

Pin-point probing into sharp crevices, filigree, small recesses and other hard-to-reach spots is the special burnishing function of Abbott Burnishing Pins. They're pointed to do the job right!

Abbott Burnishing Materials, available in five shapes . . . Ball, Ovalball, Cone, Diagonal, Pin . . . are scientifically designed to make effective contact on metal stampings or castings of any size and shape. Each piece is a burnishing tool made from Abbott's high quality bearing ball steel. Each is deep hardened and polished to a mirrorlike glass-hard finish. Make it a ***point*** to get better burnishing results in tight corners . . . use Abbott!

Abbott Burnishing Materials are available in a variety of sizes and mixtures. Send for complete catalog. No obligation.

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the all round ball

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vides an opportunity to accelerate accomplishments with economy.

The Commission feels that the Metal-Finishing Industry Action Committee can perform a useful and valuable service in advancing waste-control progress.

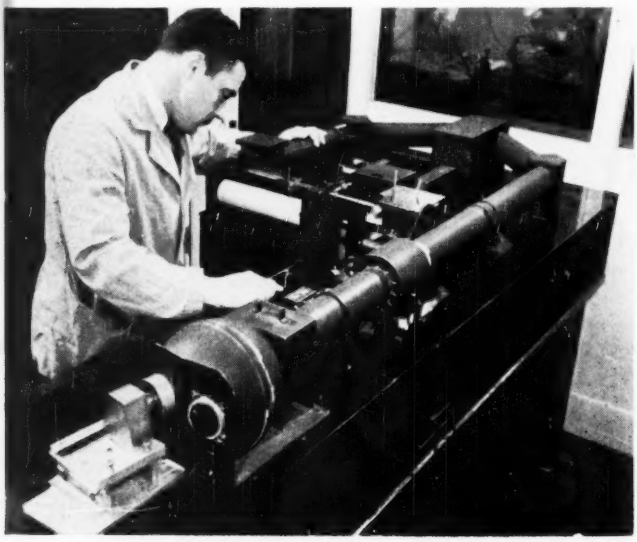
Harmony in Grays For Industrial Equipment

FIRST unified efforts of industry to reduce the number of colors for industrial apparatus, machines, and equipment are beginning to bear fruit as a result of unanimous agreement on four accurately defined grays as standard finishes. American Standards Association announces adoption of these standard grays following a consensus reached by 18 organizations and groups who represent all classes of manufacturers and users of such equipment.

General acceptance of this new standard on "Gray Finishes for Industrial Apparatus and Equipment" (ASA Z55.1-1950) by individual manufacturers and purchasers of industrial equipment and machines is expected to reduce considerably the cost of finishes and finishing. It will be of further value to purchasers of equipment by making it easier to specify and to match grays, and to produce color harmony of machines and other equipment purchased from different manufacturers. Color guides are expected to eliminate haphazard choice of shades from the limitless shade variations.

The development of color standards stems from past trouble in color identification and lack of standard color finishes for industrial products. Where master colors had been used, variations grew out of differences in formulation and aging, variations in tolerance limits, and infrequent or no comparison with master colors. Use of color names or paint number also has obvious disadvantages. The need for standard colors became acute at the start of World War II as a result of extensive sub-contracting. Attention focused on this need resulted in a study of grays.

Further investigation of the possibility of effective standardization of industrial colors led to a request by in-



Spectrophotometer in use for color measurement.

Stevens polishing lathes do more for your money

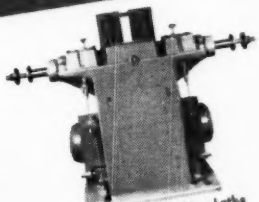
- ADJUSTABLE MOTOR BASE
- SINGLE OR DOUBLE SPINDLES
- VARIABLE SPEEDS
- INSTANT ACTION FOOT BRAKE

● The versatile line of Stevens Polishing Lathes offers all-star features. These Safety Lathes are available in single or double spindle models—with constant or variable speeds.

● The adjustable mounting base makes the motors easily accessible for service and inspection and provides easy adjustment of texrope drive. Heads are designed to give perfect balance and allow ample clearance for large work pieces. Spindles are self-aligning with either ball or roller bearings.

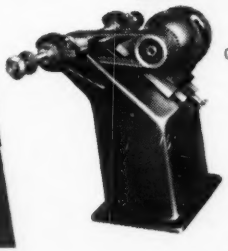
● Stevens Safety Lathes have the exclusive Safety-Action Foot Brake with a motor cutout to give split-second emergency stopping. This added feature provides the safest, most positive protection for workers of any lathe on the market.

● It will pay you to investigate the Stevens line of lathes for your polishing operations. You'll find their advanced design and rugged construction will assure you of trouble-free, long-lived performance. Write to us today for complete information about Stevens Safety Lathes



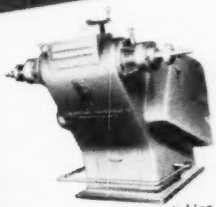
Stevens No. 7 Polishing Lathe

Motor-driven double spindles allow different speed on each spindle. Simple adjustment of variable pulleys allow two different finishes to be applied to separate work pieces simultaneously.



Stevens Overhanging Head Polishing Lathe

Motor is mounted near the head—out of the dust area. Overhanging head is perfectly balanced because of motor location and permits handling of exceptionally large work pieces. Equipped with variable speed pulleys.



Stevens Variable Speed Polishing Lathe

Fingertip control changes spindle speed—permits every work variation with no lost motion. Wheel and buff life is considerably extended since variable speeds permit maximum use of entire surface.

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FREDERIC B. STEVENS INCORPORATED

DETROIT 16, MICHIGAN

Name	Number	Munsell Notation
Light Gray	61 Gray	8.3G6.10/0.54
Medium Light Gray	49 Gray	10BG4.90/0.60
Medium Dark Gray	33 Gray	7.8B3.30/0.94
Dark Gray	24 Gray	10B2.40/1.18

dustry to the American Standards Association in November 1946, that a standards project be initiated. ASA organized a committee whose membership includes representation of industry, government, and color experts. By discussion and compromise the committee arrived at the present American Standard.

Each of the four grays may be specified by the name or number listed. The numbers indicate the approximate degree of lightness and darkness of grays. Munsell notation for hue, value and chroma accurately identifies each color.

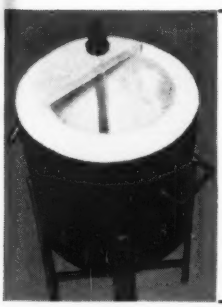
Medium Light Gray closely approximates Machine Tool Gray (7B), a standard of the N.M.T.B.A.

Contrary to the popular conception of grays, they are not necessarily variations in proportions of black and white. They may be light or dark colors with low or weak chroma (less than 1.5). Actually Light Gray is a green, Medium Gray is a blue green, and Medium Dark and Dark Grays are blues under the more discerning "eye" of a spectrophotometer.

The spectrophotometer is the basic instrument for identifying color, in accordance with an earlier American Standard on the "Specification and Description of Color." Munsell notations are derived from measurements made with this instrument.

Munsell notations were adopted for identifying opaque coatings such as paint because basic color measurements made with the spectrophotometer are not suitable for general industrial use. Munsell notations have been calibrated against the basic measurements made with the spectrophotometer and have been codified by means of color samples for easy reference in the Munsell Book of Color.

The new American Standard gives limits of accuracy within which the colors of secondary standards should be held. Because of possible changes with age, color chips should be checked at regular intervals and replaced if necessary. The standard does not specify requirements for accuracy of color finish on the equipment to which the finish is applied. Color finish of equipment is affected by gloss and texture of the surface. The standard refers to an ASTM standard concerning gloss of paint finishes and states that texture is still being investigated but that the American Standard for surface roughness may be helpful.



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Amersil manufactures a line of corrosion-resistant immersion heaters designed for heating corrosive solutions in small tanks, pots and vessels.

These units provide quick, clean, simple heating plus their versatility in being easily transferred from job to job.

Amersil also manufactures a line of heaters for larger installations.

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Our business is proving how wrong that is . . . if your product is "all dressed up" with the right finish, it's bound to go places. The right finish means greater durability, a more attractive appearance, and greater usefulness — which all adds up to empty dealers' shelves and greater customer satisfaction.

We say the **right** finish because what's right for one product is likely to be dead wrong for another. Our chemists work hand-in-hand with the manufacturer to discover the specific finish to do the specific job.

Our emphasis at Stanley on "special finishes for special applications" has already helped many manufacturers to build sales; we'd like to help build yours. Write us about your finishing needs today: The Stanley Chemical Company, East Berlin Conn.

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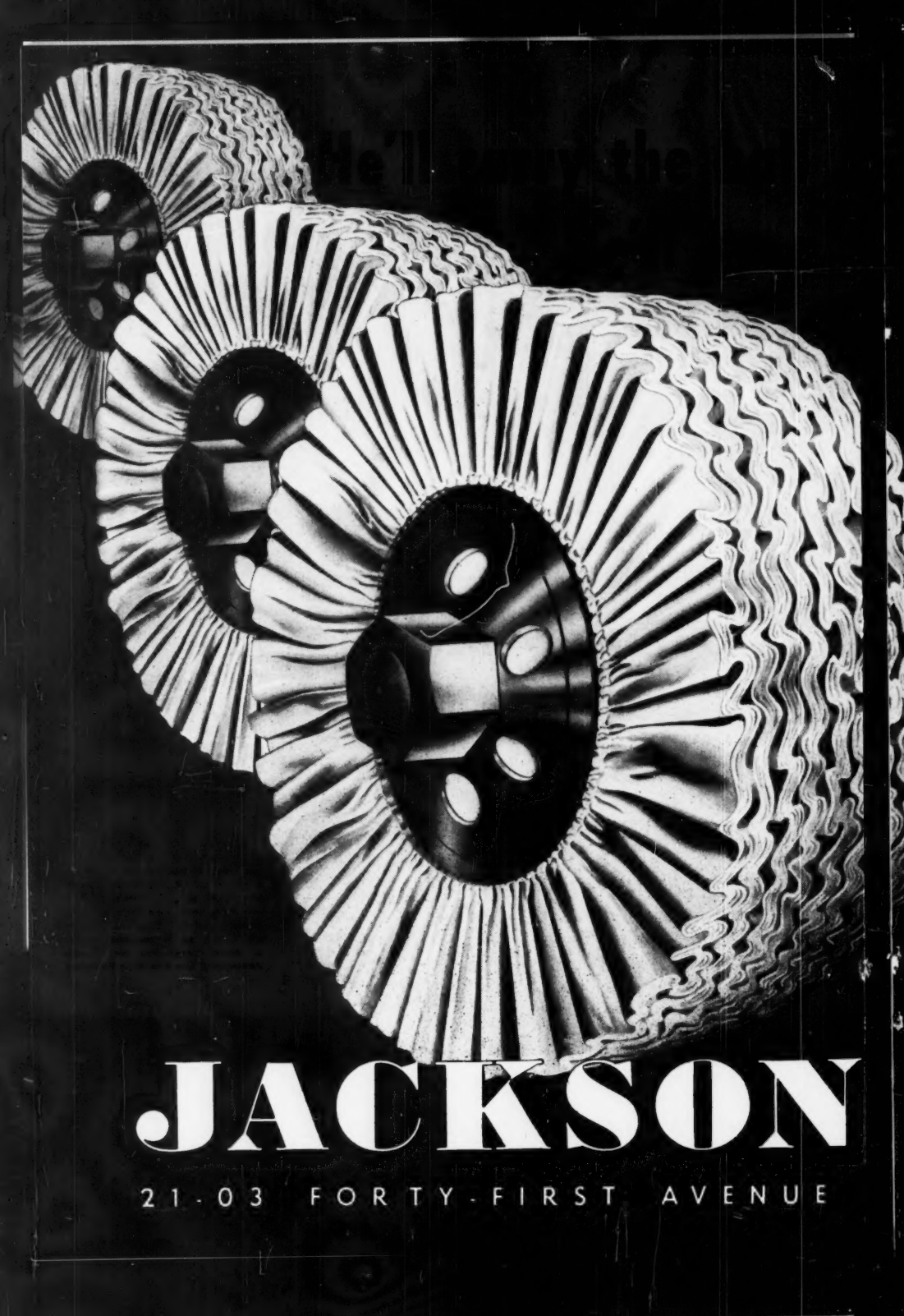
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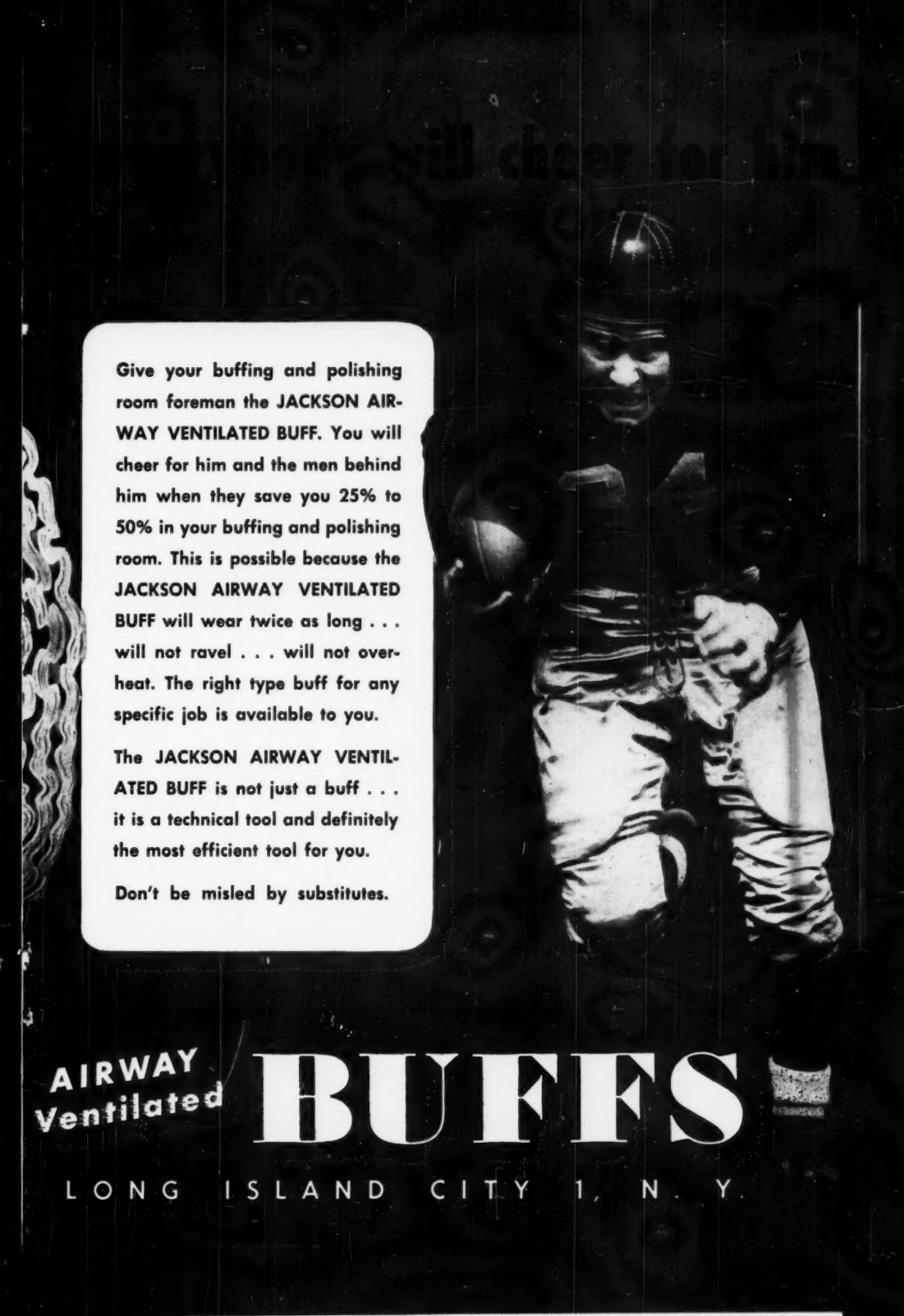
21-03 FORTY-FIRST AVENUE


Give your buffing and polishing room foreman the JACKSON AIRWAY VENTILATED BUFF. You will cheer for him and the men behind him when they save you 25% to 50% in your buffing and polishing room. This is possible because the JACKSON AIRWAY VENTILATED BUFF will wear twice as long . . . will not ravel . . . will not overheat. The right type buff for any specific job is available to you.
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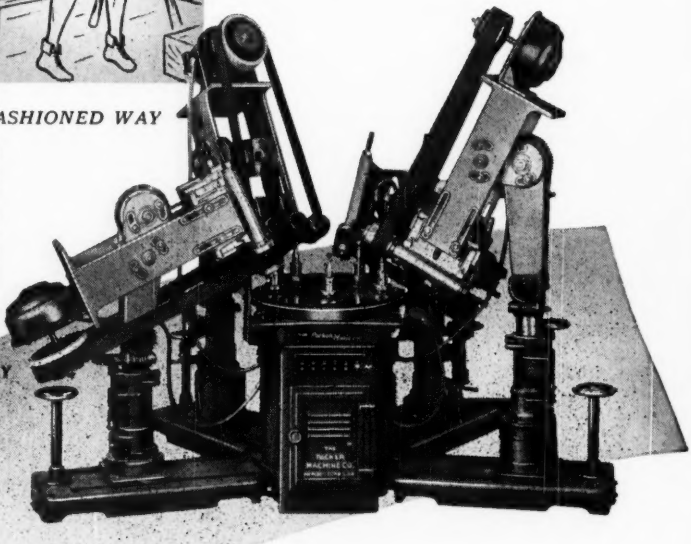

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Hand operated equipment is out-of-date in this highly competitive world. Automatic Packer-Matics meet the challenge for greater production at lower operating costs. *Here's why*: Packer-Matics polish, buff, deburr automatically. Interchangeable heads permit use of buffs, polishing, wire, tampico wheels or abrasive belts. Simplicity of set-up and ease of operation speeds production ... insures perfect finishes on varied work. Vital parts are lubricated and protected in dust proof oil reservoir to reduce wear and maintenance costs.

These are reasons for Packer-Matic preference by men who are in step with the times.

Our engineering staff invites *your* inquiry. Write to Packer Machine Co., *S. E. Div.*, Meriden, Conn.

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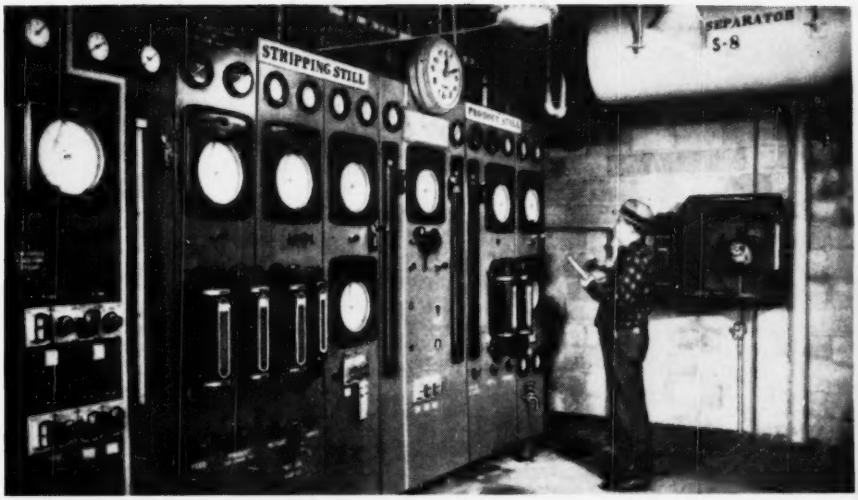
AUTOMATIC MACHINES FOR BUFFING • POLISHING • DEBURRING • GRINDING

THE PACKER MACHINE COMPANY • MERIDEN, CONN.



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NIALK TRICHLORethylene

Produced in a modern plant, NIALK* TRICHLORethylene is the modern answer to your metal-cleaning and degreasing problems. Rigid supervision of every stage of production protects its purity and uniformity.

A PAMPHLET containing information on properties and uses of NIALK TRICHLORethylene is available on request. Just send in coupon below.

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Spotlighting FINISHING Progress

Recent Developments in Viscosity Control of Paint Finishes

By DR. ALLEN G. GRAY

VISCOSITY is a property that has great influence on the application characteristics of paint finishes. The use of consistency determinations by the finishing industry may be to control the viscosity of organic finishes for brush, spray, or dip applications. Sometimes these measurements serve as a routine test of uniformity of the finish without reference to any special properties, such as brushability or leveling. The necessity for accurate and rapid viscosity measurement throughout the process of chemical coating manufacture has long been recognized. Many methods for measurement of viscosity are currently practiced; recent developments have resulted in improved techniques for controlling the viscosity of finishing materials.

The Stormer viscometer has been used for almost 40 years to measure the consistency of paints, varnishes, lacquers and associated products. The adaptation of the stroboscopic timer for use on a Stormer viscometer has greatly improved the speed and accuracy of Stormer consistency determinations. This device was described by E. P. Peterson and J. W. Prane, National Lead Company, at the 1947 Symposium on Paint and Paint Materials, held in Philadelphia by the A.S.T.M. At last year's Atlantic City meeting (June) of the A.S.T.M. Committee on Paint, Varnish, Lacquer and

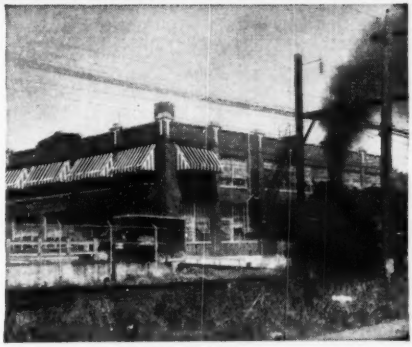
A Monthly Digest of Current Technical Progress, Indicating Significant Trends and Developments in the Finishing Industry

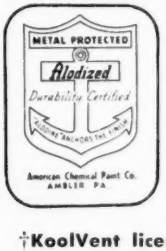
KOOLVENT VENTILATED ALUMINUM AWNINGS ARE *Alodized*®

FOR EXTRA DURABILITY!

EXTRA PAINT PERMANENCE!

Modern, colorful KoolVent Awnings are designed for all-weather service in all seasons. That means these permanent, ventilated aluminum awnings must withstand the ravages of all elements and all foreign substances—sun, rain, snow, sleet, smoke, industrial fumes, dust, dirt, salt air, soapy water—so destructive to paint life.





ALODIZED ALUMINUM provides enduring finish beauty and metal preservation. This fact, called to the attention of your customers by the attractive **ALODINE** seal, will give your products an extra selling point. The **ALODINE** seal is available to all qualified users of **ALODINE**. Details on request.

To provide the necessary paint-bonding and protective coating that meets the rigid service requirements of KoolVent Awnings, the manufacturers† of KoolVents use "Alodine" to anchor the paint finish and preserve its lustrous beauty.

†KoolVent licensees using "Alodine" and/or Alodized aluminum include:

Kool-Vent Metal Awning Co. of Cleveland, Cleveland 15, Ohio
KoolVent Metal Awning Corp. of America, Texas Division, Dallas, Texas
KoolVent Metal Awning Co. of Pittsburgh, Glenshaw, Penna.
KoolVent Metal Awning Corp. of Michigan, Detroit 4, Michigan
Aluminum Awning Co. of Arizona, Phoenix, Arizona
KoolVent Aluminum Awning Co., Mercerville, New Jersey
KoolVent Metal Awning Corp. of Indiana, Pendleton, Indiana
KoolVent Metal Awning Corp. of Chicago, Elmwood Park 35, Illinois
KoolVent Aluminum Awning, Div. of Duralco Mfg. Co., Inc., Wheeling, West Virginia
KoolVent Awnings Limited, Oshawa, Ontario
Eastern KoolVent Aluminum Awning Inc., Mineola, Long Island, N. Y.
KoolVent Aluminum Awning Co. of Arkansas, Inc., Little Rock, Arkansas
KoolVent Awnings Limited, Montreal, Quebec
KoolVent Metal Awning Corp. of N. E., Waltham 54, Mass.
KoolVent Metal Awning Co. of P.R., Inc., MacMurray & Co., Inc., Hato Rey, Puerto Rico
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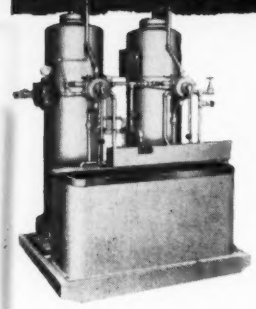

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Nickel Dip Solutions

Neutralizer Solutions

Cost analyses are proving that the use of raw water in metal coating processes is not so cheap after all. This is especially true when mineral-free water can be obtained for a matter of cents per 1000 gallons in any quantity with an INDUSTRIAL water demineralizer.

The operation is very simple. Raw water is passed through alternate beds of ion-exchange resins, and it comes out free of all mineral salts. No steam, heat, still, or cooling water is needed—keeping space requirements at a minimum.

It's simple to get the complete facts for your case. Send us a water analysis and let us know how much water you have to treat and the gallons per hour needed. We can then give you the whole demineralizer story including estimated costs, equipment required, performance data, etc., for your requirements.

Write for full recommendations

INDUSTRIAL FILTER & PUMP MFG. CO.

5904 Ogden Avenue, Chicago 50, Illinois

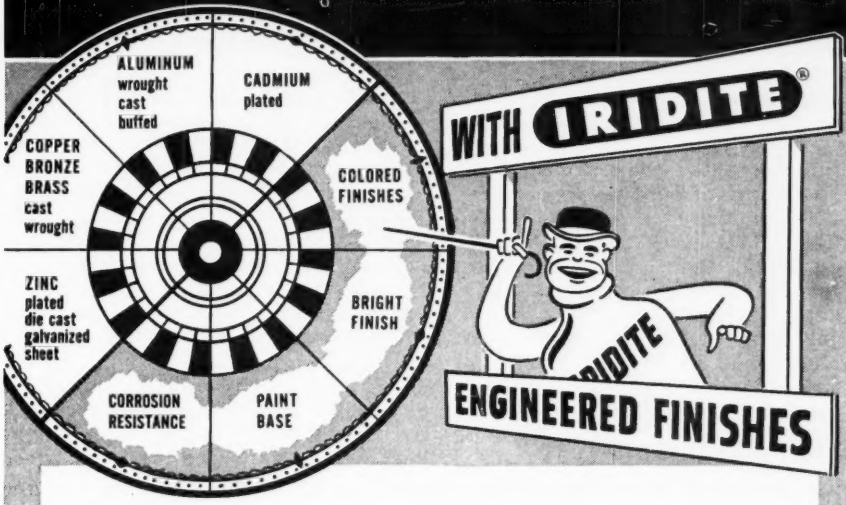
Related Product, H. B. Klimper, L. P. Larson, and J. H. Calbeck described a direct reading attachment for the Stormer Viscometer based on work conducted in the Research Laboratories, American Zinc Sales Company, Columbus, Ohio. This device provides for direct reading the consistency of paints directly on a calibrated scale in either "grams pull" or Krebs units and can be used with any Stormer viscometer equipped with a stroboscope. The purpose of the attachment is to speed up the task of running consistency measurements.

Stroboscopic Timer for Stormer Viscometer

Several members of the A.S.T.M. Committee D-1 on Paint, Varnish, Lacquer, and Related Materials, meeting in 1910, first suggested the use of the Stormer instrument for paint consistencies, using the cylindrical type rotor. The instrument was made up of a concentric cup and rotating hollow cylinder driven through a set of gears by a weight attached to a string drawn over a pulley. The rotor was also geared to a dial indicator which made one revolution per 100 rotor revolutions. Workers studying the instrument first recommended an "index of viscosity" equal to the force required to produce a given rate of shear. The viscosity was indicated by the weight in grams necessary to cause the rotor to operate at 100 r.p.m. Due allowance was made for friction and temperature standardization. Other workers in the field studied the effect of friction in the instrument upon the apparent viscosities of pigmented and unpigmented oils relative to water, and found differences in the relative apparent viscosities of as much as 20 per cent on changing the driving weights. This early work showed the effect of rate of shear on the observed viscosity in systems which are not true liquids.

In the early 1930's the Krebs Pig-

YOU'RE A WINNER EVERY TIME!



Spin the wheel for any type of chemical finish on non-ferrous surfaces . . . plated, die cast, galvanized, or sheet . . . and there's an Iridite to provide corrosion resistance, a base for paint or to produce an attractive, eye-appealing finish in a variety of colors.

In addition, there are Iridite coatings that can impart a brilliant, chrome-like finish to plated surfaces.

Aluminum fabricators are finding many uses for a newly developed Iridite that can be used for passivation of the surface without changing its appearance, or for extremely high resistance to corrosion.

And supplementing the Iridite chemical coatings are the ARP plating chemicals. These include addition agents to assist the formation of bright metal deposits from zinc and cadmium plating baths and wetting agents for more efficient acid pickling or cleaning of metal surfaces.

Regardless of the type of metal being treated, or the particular Iridite used, a fraction of a cent is the cost for processing a square foot of surface. This low cost, combined with simplicity of operation, makes you the winner when you choose Iridite for your metal finishing problem . . . or when you try our low cost brighteners for zinc and cadmium plating solutions.

WRITE FOR FREE SAMPLES AND LITERATURE.
Or, for your own tests, send us specimens of your regular production for free sample processing.

SPECIAL PROCESSES—Research and development of special metal finishes is scheduled as manufacturers present their problems to us. Let us go to work on yours.

Manufacturers of Iridite Finishes for Corrosion Resistance and Paint Systems for Non-Ferrous Metals—ARP Plating Chemicals. West Coast Licensee—L. H. Butcher Co., Los Angeles 23, Calif.

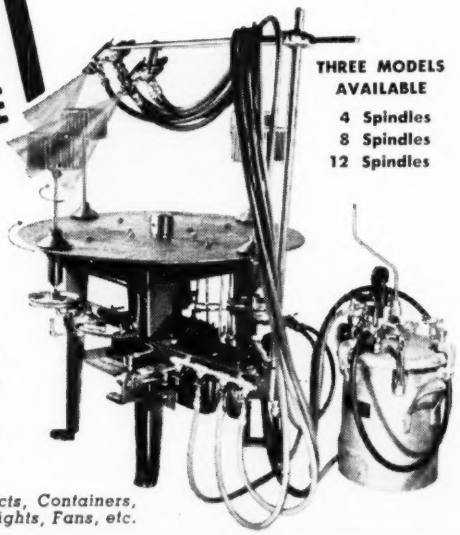
ALLIED RESEARCH PRODUCTS, INC.
4004 EAST MONUMENT STREET
BALTIMORE 5, MD.

ment and Color Corporation developed two important modifications in the use of the Stormer viscometer: the first was a substitution of a two-pronged fork for the cylinder of the instrument; in the second the system of Krebs units for the expression of paint consistencies was developed. These units were derived from a series of measurements on heavily pigmented lithopone-tung oil-soybean oil flat paints. A paint considered to be of proper brushing consistency by several competent observers was assigned an arbitrary value of 100 Krebs units. Additional paints, both thicker and thinner than this standard, were prepared, and successive paints selected to differ in consistency by equivalent steps, arbitrarily given values of 10 Krebs units, ranging in consistency from 40 to 175 units.

In 1940 it is reported that Subcommittee VIII on Methods of Chemical Analysis of Paint Materials of A.S.T.M. Committee D-1 ran consistency tests on five different paints in five different laboratories, using the A.S.T.M. and Ford Cups, the Gardner Mobilometer and the Stormer viscometer. From the results it was reported that the Stormer apparatus gave better, more dependable and more reproducible values. On this basis, there was set up Tentative Method of Test for Consistency of Enamel Type Paints (D 562-40T) which was adopted as standard without revision in 1941. This test method was withdrawn and devised to replace the forked type rotor with a submerged, two-bladed paddle developed in 1942. The method was republished with the modification as tentative in 1942, and it was adopted as standard in 1944 (D 562-44).

The A.S.T.M. method introduced an important innovation in the expression of consistency as the driving weight required to produce a rotational speed

HOLLAND
automatic-pneumatic
SPRAYING MACHINE



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4 Spindles
8 Spindles
12 Spindles

- GIVES AN EVEN FINISH
- SPEEDS UP PRODUCTION
- IMPROVES QUALITY OF PRODUCT

This new fully automatic, portable spraying machine is activated *solely* by air pressure. Only one operator is needed to load, and remove finished and unfinished work. WRITE FOR FULL INFORMATION.

Ideal for spraying: Cans, Novelties, Compacts, Containers, Aluminumware, Electrical Appliances, Flashlights, Fans, etc.

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IS THERE A S-L-O-W D-O-W-N GOING ON IN YOUR PLANT?

YOU CAN STOP IT—STEP UP PRODUCTION
REDUCE MATERIAL HANDLING COSTS WITH

JENSEN

LOOP AROUND • STRAIGHT LINE
DUAL STRAND • BELT • SPECIAL

CONVEYORS

EQUIPPED WITH VARIABLE SPEED DRIVES

There is one type of industrial slow down you can and should guard against . . . the slow down caused by the impractical use of expensive manpower for material handling operations. Today, in the face of keen competition you need the savings available to you through modern material handling equipment and methods. $2.00 is too much to spend for labor to accomplish a 20c job!

Whether your conveying needs call for wire mesh, loop-around, straight-line, stainless steel, canvas or rubberized belting makes no difference—*Jensen makes them all.* Installations are skillfully designed and engineered to coordinate with production operations permitting continuous processing of work while in transit. Thus, material handling costs are kept at "rock bottom."

As a pioneer in electrical radiant heating equipment Jensen specializes in fully coordinated finishing systems, incorporating planned conveying. Write today for descriptive literature. Better yet, call in a Jensen representative to look over your operation and submit recommendations.

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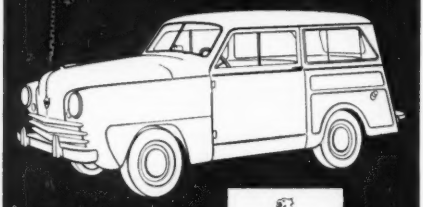
MANUFACTURERS OF *ECONOMY-ENGINEERED* RADIANT HEAT EQUIPMENT

"DUAL HEAT" INFRARED OVENS • CONVEYORS • PAINT DIP TANKS

Crosley Motors

LIKES LACQUER BEST BECAUSE...



. . . lacquer offers Crosley Motors a unique finish, every step of the way . . . in production, on display, and in use.

On the finishing line, workable lacquer dries in minutes. This means almost immediate mar resistance, minimum dirt pickup.

On display, lacquer means eye and buy appeal...sleek good looks and obvious operating economy.

Even after purchase, lacquer delivers the goods. Any damage in transit or use can be cheaply and easily "spotted" with lacquer, thus eliminating the need for complete refinishing.

HERCULES POWDER COMPANY
927 Market St., Wilmington, Delaware

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LACQUER
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of 200 r.p.m. The rate of shear is adopted as a constant, and the force required to produce this prescribed rate of shear is taken as a measure of the consistency. This procedure results in correlative values for the entire range of consistencies measurable by the Stormer instrument. It has been pointed out that the A.S.T.M. method possesses several advantages over the use of Krebs units. The values offer more real significance, although dependent upon the actual rate of shear used and the rheological pecularities of the finish.

In discussing the development of the stroboscopic timer, Peterson and Prane pointed out that the A.S.T.M. method is more laborious and this has restricted its application. Thus, in order to find the load that produces 200 r.p.m. in the Stormer viscometer, it is necessary to make at least 2 determinations within the range of 27 to 33 seconds for 100 revolutions and extrapolate the results to 30 seconds for 100 revolutions. Each determination has a possible source of error in reading the stop watch and the Stormer dial. In addition, thixotropic increase of viscosity may occur between determinations. Many of these sources of errors are eliminated with a stroboscopic timer that is mounted on the paddle shaft.

The paddle fits into a chuck in the timer. The timer consists of a neon glow lamp that flashes 60 times per second, and a thin-walled aluminum rotor having 18 equally spaced vertical slots. At 200 r.p.m. the lines in the rotor appear to be motionless. To use the timer, it is plugged in, the estimated load placed on the weight loader, and the brake released. If the lines of the rotor move to the right, the speed exceeds 200 r.p.m.; if to the left, the speed is less than 200 r.p.m. The machine can be stopped and weights added or removed until a speed of exactly 200 r.p.m. is obtained. According to results reported in testing the

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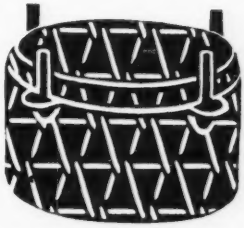

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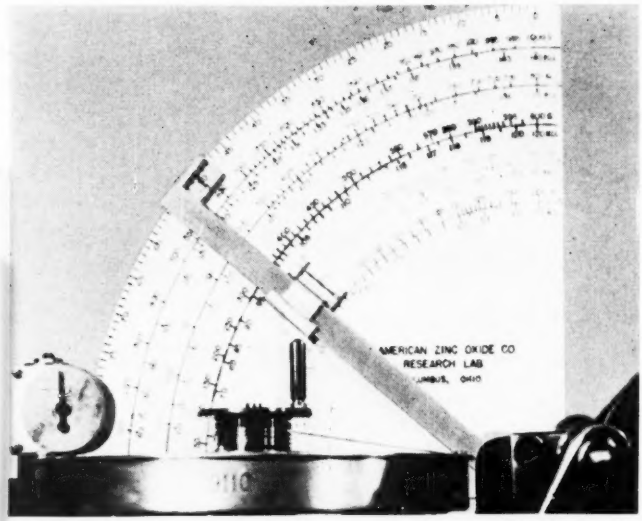

Fig. 1—The computing scale and pointers for use with the direct reading attachment. (*Illustration courtesy American Zinc Sales Company and A.S.T.M.*)

method, different operators can cross check more closely when using the stroboscope than when using stop watches; in addition, tests have shown that less than one-half the time is required. The modification of the Stormer viscometer by the addition of the stroboscopic timer provides a sturdy instrument which is more accurate and more quickly read, suitable for both plant and control work as well as laboratory research.

Direct Reading Attachment for the Stormer Viscometer

The direct reading attachment for the Stormer viscometer designed in the Research Laboratory of the American Zinc Sales Company is another development that speeds readings. Instead of falling vertically, the weight slides on a rod. By adjusting the angle of inclination of the rod, the operator varies the vertical component of the weight until an angle is found that gives the rotor a 200 r.p.m. speed. Once a determination is begun, there is no interruption to adjust the weight.

According to a description of the attachment by Klimper, Larson and Calbeck, of the American Zinc Sales Laboratory, the apparatus consists simply of a heavy base which may be secured to a table by means of three screws. Attached to the base and extending upward and slightly to the right are two brackets 15 inches long. These brackets provide a support for a stationery brass quadrant and a large aluminum quadrant upon which the computing scale is printed. Between the two brackets and revolving about a horizontal axis is a brass yoke on a hinge which supports the slide rod and weight. Attached to the yoke is a ratchet lever which engages cogs on the brass quadrant whereby the angle of inclination may be adjusted. For a fine adjustment, a thumb screw engages the brass quadrant to rotate it 5 degrees. The combination of the ratchet handle, the thumb screw, and the brass quadrant makes possible the adjustment of the angle of inclination in a matter of one or two seconds.

On the opposite end of the yoke is an aluminum bar which carries a fixed hair-line pointer and an adjustable sliding hair-line pointer. These pointers, together with the calibrated scale of the large quadrant, provide the direct reading feature of the instrument. The computing scale and pointers are shown in Fig. 1. As can be noted, there

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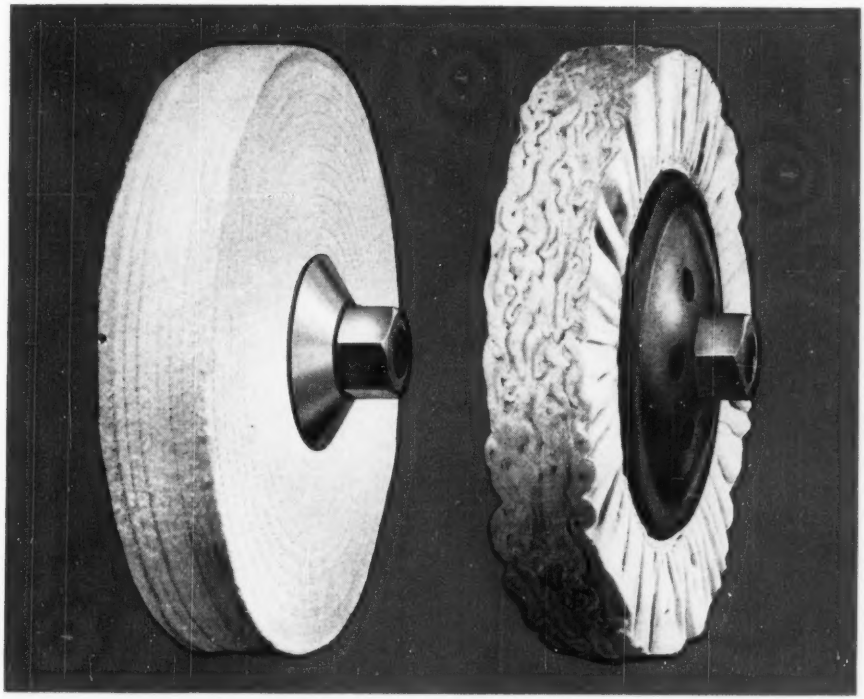

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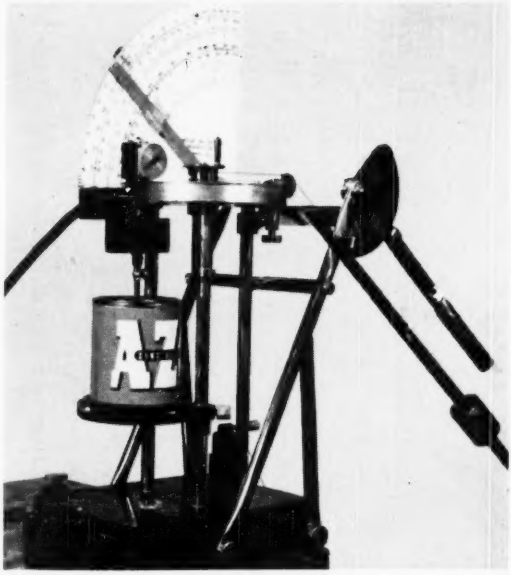

Fig. 2 — The complete apparatus showing the direct reading attachment and the Stormer instrument in place.
(Illustration courtesy American Zinc Sales Company and A.S.T.M.)

are six concentric scales on the quadrant. The scale on the largest diameter is one showing graduated degrees of arc. The fixed hair-line on the pointer always indicates the angle of inclination in degrees. The next scale of shorter radius is used when a 1000 g. slide weight is necessary. This scale consists of a solid line with "grams pull" graduation on the outside and Krebs units on the inside of the line. Then, in regular order, are given the scales for the 800, 600, 400, and 200-gram weights. The sliding hair-line pointer should be adjusted to correspond to the weight being used.

To use the attachment, a Stormer viscometer with stroboscope attached is slid into position on the heavy metal base and fastened tightly by two thumb screws. Figure 2 illustrates the apparatus with the Stormer instrument in place. The draw card of the Stormer instrument is attached to an eye in the slide weight and pulled to the top position by cranking the winding drum with the brake "on." The stroboscope is connected to a light source, a submerged paddle attached to the spindle, and the can of the finishing material to be tested is adjusted to the proper level in the usual manner. The determination is made by simply releasing the brake and adjusting the angle of inclination with the ratchet lever and the thumbscrew until the endpoint is obtained on the strobo-

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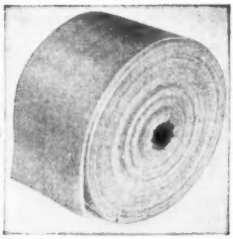
scope. This is reported to require only a few seconds; during this time the slide weight (at right on Fig. 2) will have traveled only a fraction of the distance down the inclined slide rod. The consistency of the paint is read on the computing scale in either "grams pull" or Krebs units.

In developing the test method it was found advisable to use a set of four different slide weights in order to provide conveniently a "grams pull" range from 0 to 1000 grams. However, the accuracy and ease of operation of the instrument is greater when the lightest possible weight is used or, in other words, when the smallest angle of inclination is required. Although error due to friction increases as the slide rod approaches a horizontal position, this factor is not as important as the speed and ease of adjustment which is better when the angle of inclination is small. A series of nested weights was developed for use with the instrument.

The assembled apparatus may be checked against a standard paint or against an oil. The developers of the direct reading attachment for the Stormer viscometer suggested the method of oil checking reported by C. F. Jackson and W. H. Madson, of the Du Pont Company's Pigments Department, before last year's meeting of A.S.T.M. Committee D-1 on Paints, Varnish, Lacquer and related products held in Atlantic City, N. J. (see also "A.S.T.M. Bulletin," Oct. 1949). Jackson and Madson discussed the general importance of periodically checking the Krebs Modified Stormer viscometer since this type of instrument contains moving parts which can and do become clogged with dirt and dried paint.

Standardization Method for Viscometer

Jackson and Madson stated that data derived earlier by J. A. Geddes



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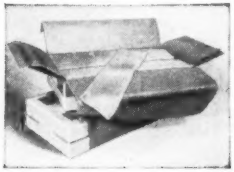

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and D. H. Dawson (see also "Ind. Eng. Chem.," 34, P. 63, 1942) indicated that the relationship between poises of hydrocarbon oils and grams per 200 r.p.m. on a Stormer instrument would be a straight line. Thus, if this indicated straight line function were established, then a graph could be set up by the paint man for use in checking his instrument. It would be necessary for him to secure a sample of a hydrocarbon oil with known poise values at specific temperatures and run it on his Stormer instrument. Then reference to the graph would tell him whether his instrument was in good working order.

For use in the experimental work, a sample of standard viscosity oil "N" was secured from the National Bureau of Standards, Washington, D. C. This particular sample of oil was reported by the National Bureau of Standards to have a viscosity value of 13.79 poises at 20 deg. C.; 9.34 poises at 25 deg. C.; and 3.85 poises at 37.8 deg. C. (100 deg. F.). Measurements were made on the oil at each of the three different temperatures with several Stormer instruments equipped with stroboscopic timers. The results obtained by plotting these data confirmed the indicated straight line relationship. Using a portion of the data developed with Bureau of Standards oil "N" the graph shown in Fig. 3 was produced. The broken line, which falls directly down the center of the band made by the two solid lines, is a section of the "standard Stormer viscometer" line.

It will be noticed that at any given poise value, the band formed by the solid line is 8 g. wide. Therefore, this

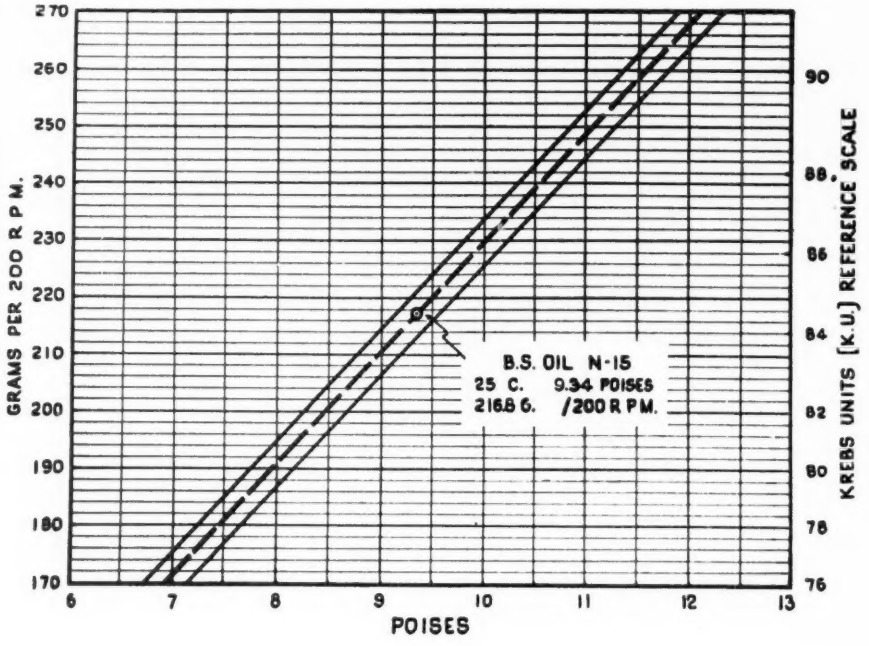

Fig. 3—Chart used in standardization of modified Stormer viscometers. (*Illustration courtesy A.S.T.M.*)

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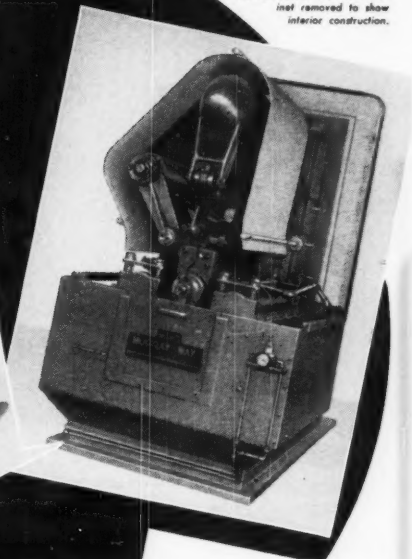

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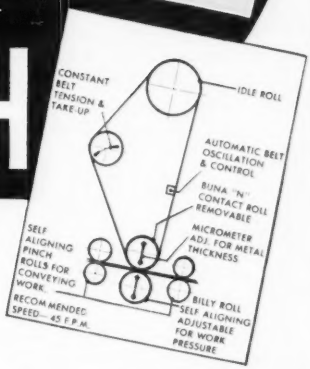
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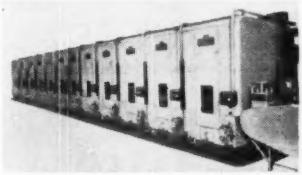

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band represents a 4 g. tolerance from the "standard" line. This tolerance was predicated on specification paddles, accurate timing, and an oil temperature control of 0.05 deg. C. With respect to timing, it was stated that the accuracy obtained by the stroboscopic timer can be duplicated closely by the stop watch method, but not as easily or with as few determinations. The following steps were suggested for use in conjunction with the graph shown in Fig. 3 for the standardization of Krebs Modified Stormer Viscometers, to check the performance under conditions of use with normal loads:

1. Secure a sample of hydrocarbon oil, similar to National Bureau of Standards oil "N," with a known viscositly of 9.00 to 10.00 poises at 25 deg. C. In some cases the worker may find it advisable to standardize his own oil to minimize errors from temperature differentials. The oil should be used in a quantity of no less than 1 pint. A standard 1-pint, round, friction top can is the preferred container.

2. With the specification paddle-type rotor in place on the apparatus, set the oil sample in position making sure that the paddle shaft is in the center of the can.

3. Bring the oil to temperature and hold to 0.05 deg. C. for at least 15 minutes before making any viscometer readings.

4. When the temperature equilibrium has been established, the weight to the nearest gram for 200 r.p.m. is determined. Caution should be observed to make sure that the string is always wound evenly on the drum and is not allowed to overlap itself.

5. Using the determined gram-weight and the poise value of the oil, plot the point on the graphs of Fig. 3. If the point falls within the band, the instrument under test may be considered as performing satisfactorily in comparison with the "standard Stormer viscometer." An average

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value secured from tests made by experimenters Jackson and Madson with five new instruments was used in the derivation of the graph. The method presupposes accuracy of controllable factors such as temperature, weight, timing, oil standardization, specification paddle, and operating techniques. In the case of points that fall outside of the band, the determination should be rechecked.

Another point emphasized in the overall standardization procedure is the importance of examining the free-running mechanical performance of the apparatus including a check of the paddle dimensions. An instrument which does not meet requirements here is not satisfactory for normal use in determining the consistencies of paints and other materials.

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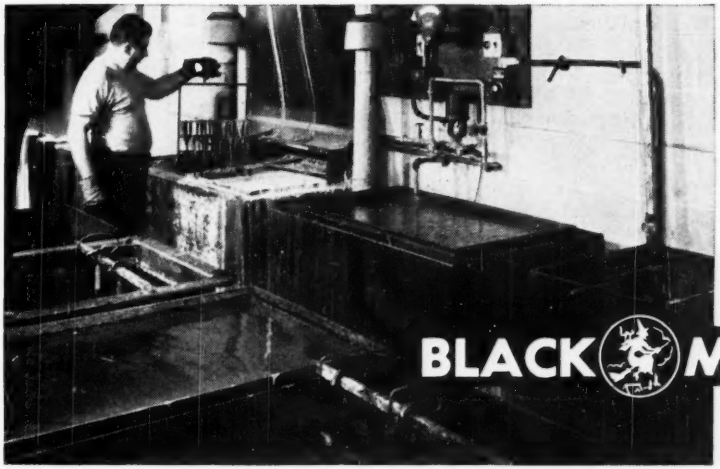

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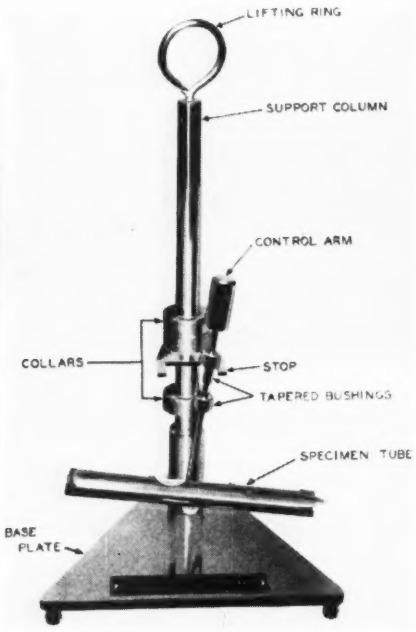

Fig. 4—The Interchemical inclined tube viscometer manufactured by the Gardner Laboratory.

Division, Interchemical Corp., which has resulted in the Interchemical Inclined Tube Viscometer. This instrument, which was described by Euverard before the 1947 A.S.T.M. Symposium, is commercially available from the Gardner Laboratory, Bethesda 4, Md. This viscometer is based on the fact that a bubble rising in a tube travels at a maximum speed when the angle is approximately 45 degrees. At this angle the speed is about twice that when the angle is 90 deg., or vertical. It can be seen how the speed would be zero in the horizontal position. At angles of less than 15 deg., the speed is less than it is at 90 degrees. Thus, according to the relationship worked out by Euverard, small angles make it easier to compare liquids of low viscosity, whereas angles of approximately 45 deg. speed up the comparison of liquids of high viscosity.

However, instead of directly comparing speeds of bubbles, as in the original Gardner-Holt tubes, referred to above, a stop watch is used to time the travel. The size of the tube and the distance of travel are such that the viscosity in stokes is one-tenth the time in seconds when the tube is held at an angle of approximately 8 deg. and it is one-half the time in seconds when the tube is held at an angle of approximately 13 degrees. Figure 4 shows the test instrument made by the Gardner Laboratory. A specimen tube containing the viscous fluid to be measured is secured in the apparatus by clamps. The control arm is moved to the left until it comes in contact with the stop, and the time for the leading edge of the bubble to travel between two measured points is determined. The control arm is then moved to the right and the time for leading edge of the bubble to flow back is measured. The bubble is timed flowing in both directions to compensate for small errors of apparatus leveling.

In using this method the angles of the viscometer are calibrated with liquids of known viscosity. Determination of unknown liquids is made in selected tubes having the same internal diameter. The apparatus can be used for a wide range of measurements. It is reported that viscosities from 0.6 to 150 stokes can be measured without readjustment.

* * *

Determination of the Roughness of Metallic Surfaces

AT the Symposium on Theoretical Electrochemistry, conducted during the recent 97th meeting of the Electrochemical Society, Carl Wagner,

LOWER COST FINISHING

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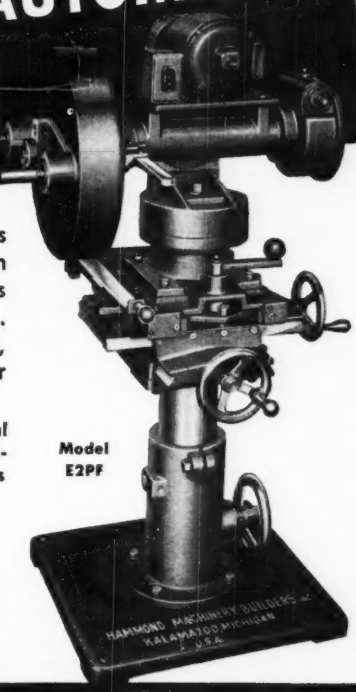
Hammond JUNIOR AUTOMATIC

POLISHING AND BUFFING MACHINES



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1622 DOUGLAS AVENUE ★ KALAMAZOO, MICHIGAN, U. S. A.

Massachusetts Institute of Technology, presented data to show that the polarization capacity of an electrode

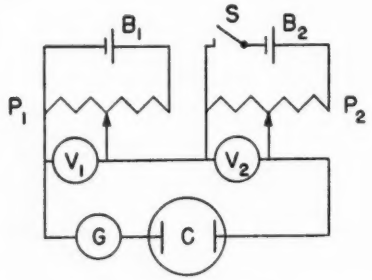

Fig. 5—Setup for measurement of polarization capacity for application to determination of the roughness of metallic surfaces. B_1, B_2—storage batteries; P_1, P_2—potentiometers; V_1, V_2—voltmeters; S—switch; G—ballistic galvanometer; C—electrolytic cell with measuring electrode and reference electrode. *(Illustration courtesy "J. Electrochemical Society")*

can be measured with the aid of a ballistic galvanometer. The polarization capacity per unit apparent area can be considered to be approximately proportional to the roughness of the surface of the electrode. It was pointed out that this method may be of special value in determining the roughness of electrodeposited coatings and corroding metals because the method can be used in the case of small areas and the measurements can be made under the conditions of immediate interest. No essential change of the state of the surface owing to the measuring procedure is to be expected.

The method suggested by Wagner is based on the measurement of the current-time integral for a given change of the potential with the aid of a ballistic galvanometer. The basic set up is shown in Figure 5.

In the beginning, switch **S** is open so that the voltage furnished by the potentiometer $\mathbf{P}_2$ is equal to zero, but an initial potential may be applied with the aid of the potentiometer $\mathbf{P}_1$. Then switch **S** is closed and thereby an additional voltage indicated by voltmeter $\mathbf{V}_2$ is applied. The current-time integral is obtained from the maximum deflection of the ballistic galvanometer **G**, the sensivity of which is appropriately reduced by a shunt in parallel. Since for a surface area of 1 sq. cm., the current-time integral is rather large, a portable galvanometer with not too small a time constant can be used. The polarization capacity is calculated from the equation below by replacing the product of current and time by the corresponding integral.

$$C = \frac{I}{A} \frac{\Delta t}{\Delta E}$$

In this equation a direct current of given strength, **I**, is applied and the resulting change, **E**, of the potential is observed as a function of time, **t**. The polarization capacity, **C**, per unit apparent area can thus be calculated where **A** is the apparent surface area of the electrode.

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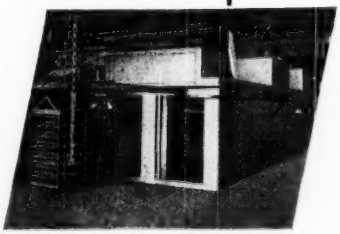
for baking and drying

Designed and built to produce the finest results in baking processes such as PAINT FINISHING, METAL DECORATING, INSULATION BAKING. Batch or Conveyor Types for any fuel. Write for Bulletin 3.



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THE FIRST REVOLUTIONARY IMPROVEMENT IN POLISHING BELTS IN 30 YEARS

Rayon-Resin polishing belts are designed to give maximum service and long life, and they do this in a money saving manner that has made the Polishing Industry sit up and take notice. Here is a polishing belt that is extremely rugged yet completely flexible—built to last for 1000 set-ups with negligible stretch or shrinkage. Belts are available from 2" to 40" widths and from 96" to 168" lengths.

MONEY SAVING COMBINATION

The use of GRAINLOCK polishing cement as the abrasive bond when belts are recoated, insures top performance and a longer production run between set ups. A specific cement is available for every metal polishing need.

Belt Resetting Service

● For those plants that do not have the facilities for resetting polishing belts, we offer a belt resetting service that is fast, efficient and dependable. Belts are recoated to your specifications at a very nominal cost.

Don't delay in writing for additional information. We shall be pleased to work with you and show you how to effect amazing savings in your polishing department with this new Rayon-Resin polishing belt.

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14459 WILDEMERE, DETROIT 6, MICHIGAN

NEWS of the Industry

NEW PLANTS

The acquisition of a large Eastern plant as a major step in a continuing expansion program was announced by **TURCO PRODUCTS, INC.**, Los Angeles, Calif., manufacturer of industrial cleaning compounds. The new facilities, located at 120 Lister Ave., Newark, N. J., will serve as a manufacturing and laboratory center for Turco's Atlantic Division.

Present manufacturing maximums will be approximately doubled by the six major buildings covering 58,000 square feet and by the 950,000-gallon storage capacity of the new three-acre site. Ideally located adjacent to the Pulaski Skyway and the main line of the Pennsylvania, the new factory has an in-the-plant spur line connecting to all major rail facilities, as well as complete dock and lighterage facilities on the Passaic River.

Sidney E. Smith has been appointed general manager in charge of the Atlantic Division factory at Newark. With him is A. H. Dekker, Turco general procurement director, who is working with Mr. Smith, setting up procurement, distribution and operating schedules.

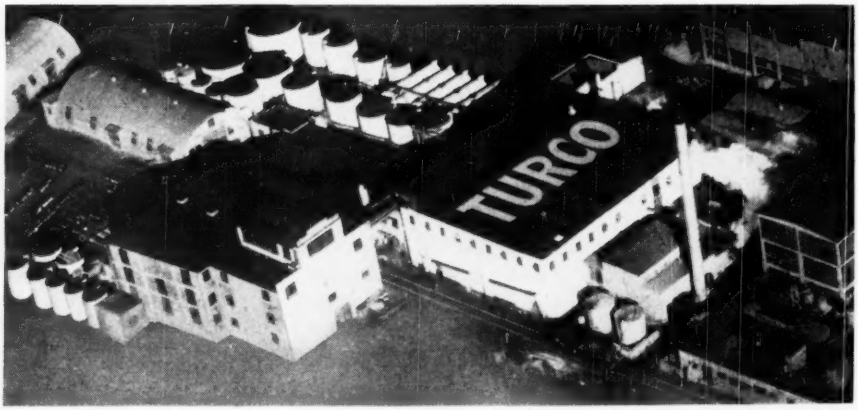
N. B. Williford, previously head of Turco's Texas factory, has been appointed production superintendent.

Thomas Franzreb, process engineer, is forming and will head a process engineering group which will make special field studies of cleaning problems in the plants of Eastern Turco customers. The production control section will be headed by John Adamzevich.

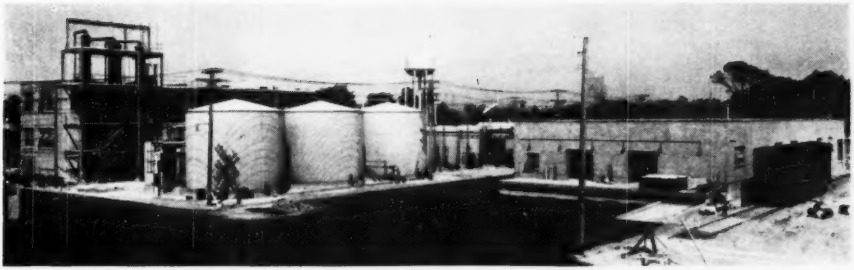
Completion of a large, modern trichlorethylene manufacturing plant at Ashtabula, Ohio, has been announced by **HOOKER-DETREX INCORPORATED.**

The full production capacity of the plant will be utilized in the manufacture of Perm-A-Clor and Triad metal degreasing solvents for the **DETREX CORPORATION**, Detroit 32, Michigan.

The latest developments in production techniques and equipment have been installed in this plant to provide highest quality of product at minimum cost. The plant is located in one of the few areas



Newly acquired plant of Turco Products, Incorporated.



Modern, high-production degreasing solvent manufacturing plant at Ashtabula, Ohio.

in the United States where all raw materials are directly available through pipelines from adjacent plants. It has the advantage of being centrally located with respect to major industrial centers. These manufacturing areas will benefit by having a nearby F.O.B. point for solvent.

It is expected that full-rated production capacity will be reached by November 1, 1950, thus assuring all contract customers of their requirements of degreasing solvents. This additional capacity can be utilized to supply the currently increasing demand for non-flammable degreasing solvents.

Hooker-Detrex Incorporated is a jointly owned subsidiary of Hooker Electrochemical Company and Detrex Corporation. The works manager of the Ashtabula plant is H. D. McKinley, formerly manager of the solvents division of Detrex. Mr. McKinley also collaborated in the design, erection, and initial operation of the Hooker-Detrex solvent manufacturing plant at Tacoma, Washington, three years ago. The manufacturing operations of both the Ashtabula and Tacoma plants are supervised by Hooker Electrochemical Company.

The national distribution of the entire output of these plants is handled exclusively by Detrex Corporation.

SCHAFFNER MFG. CO., Pittsburgh Pa., manufacturer of Schaffner's Buffing Compositions, has completed an expansion in plant facilities, warehousing space, and production equipment. This addition to its new, modern plant will increase production approximately 75 per cent.

In addition to manufacturing its own buffing and polishing compounds, the company is also adding a Platers' Supply Division.

RAPID ELECTRIC COMPANY has moved to larger quarters at 2881 Middletown Road, Bronx 61, N. Y., in a plant specially designed and built for the manufacture of a complete line of selenium rectifiers and periodic reverse units. At the new location, three times as large as the former shop, expanded engineering and research departments will be installed, allowing the firm, which offers free consultation service to the trade, to study and solve a wider variety of production problems at any given time.

COMPANIES

THE KAY & ESS CO., Dayton 1, Ohio, upon the occasion of entering its 50th year of business, has issued an announcement reviewing briefly the history of the organization and describing its manufacturing facilities, products, and services to customers.

Incorporated on May 9, 1901, by A. M. Kittredge, The Kay & Ess Company was dedicated to the manufacture of varnishes, japans, and enamels for industrial consumption. Two examples can be cited concerning special finishes developed by the company. The first wrinkle finish was developed at The Kay & Ess Company, and Kay & Ess engine enamel was used on the aircraft engine of the plane in which Lindberg flew the Atlantic.

Plant facilities of this centrally located concern include 16 buildings on seven acres of land and a private railroad siding accommodating 10 cars. Production equipment includes 16 synthetic and oleoresin varnish stacks, two 100 h.p. boilers, and grinding and dispersion mills of steel ball, pebble, roller and buhrstone types. Mixing and blending tanks ranging in size from 1000 gallons to 50 gallons facilitate production of orders in any quantity.

Product development and research laboratories occupy an entire floor of one building. This important activity solves customer finishing problems and develops new materials to meet specific finishing requirements.

Products supplied by The Kay & Ess Company include paint, lacquers, enamels, wrinkle finishes, hammer finishes, and roller coating materials. The company points out that finished products are not stocked. All finishes are "specials," made to customer specifications.

PAINT MIXER

MIRACLE
5 GALLON
PAINT REJUVENATOR

All paint restored to original consistency without opening the can.
2 minutes per gallon.

MIRACLE PAINT REJUVENATOR CO.
128 E. 10th St., St. Paul 1

KRAFT CHEMICAL COMPANY, 917 West 18th Street, Chicago 8, Illinois, announces that it is the Midwest sales representative for Better Finishes & Coatings, Inc., Newark, N. J., only for the distribution of high quality plating grade chromic acid flake.

R. W. RENTON AND COMPANY with facilities in Cleveland and Indianapolis, has recently completed arrangements with United Chromium, Incorporated for the application of Unichrome plastisol and air-drying rack coatings.

Robert A. Liebel, president of **ENAMELSTRIP CORP.,** Allentown, Pa., has announced that the corporation has appointed the Metal Purchasing Co., 501-551 W. 30th St., New York, N. Y., exclusive sales representative for its complete line of pre-painted strip steel in coils.

The Enamelstrip Corporation has pioneered in the development of this material in coil form and is currently supplying many users of pre-painted strip steel with a high quality, uniformly coated product in coils, precision cut to required widths. The Metal Purchasing

SAVE COSTLY SCRAPE DOWNS

Using expensive labor to scrape down spray-booths costs a lot more than peeling off accumulated overspray in big sheets. Safer, too.

Order a 5 gallon Test-Sample at Drum Lot price.

LIQUID ENVELOPE
PEELABLE
SPRAY-BOOTH COATING

DISTRIBUTED BY

General Spray Equipment Co., Boston, Mass. • Bay State Equipment Co., Springfield, Mass. • Lea Manufacturing Co., Waterbury, Conn. • Edgcomb Steel of New England, Milford, Conn. • Kellerman Paint Co., New York, N. Y. Grapek Paint Co., Newark, N. J. • Pennsylvania Lacquer Center, Philadelphia, Pa., • R.W.Renton Co., Cleveland, Ohio, Indianapolis, Ind. • Dean & Barry Co., Columbus, Ohio • Vic Miner Co., Toledo, Ohio • Abrasive & Supply Co., Detroit, Mich. • Melson Industrial Supply Corp., Grand Rapids, Mich. • O'Donohue Sales Co., Milwaukee, Wis. • Paints & Lacquers Inc., Chicago, Ill. • Tanner & Co., Indianapolis, Ind. • Metal Goods Corp., St. Louis, Mo., North Kansas City, Mo., Dallas, Texas, New Orleans, La. • Hubbard & Stau, Los Angeles, Calif • M. E. Smith Co., Los Angeles, Calif. • C & H Supply Co., Seattle, Wash. • Hugh Russel & Sons Ltd., Montreal & Toronto, Canada.

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Shipped Complete, Tested, Ready-to-Operate!

At left: *Electrically heated, automatically controlled oven for baking insulating varnish on coils, stators and other parts at Internat'l. G. E. Service Shop, Mexico City.*

At right: *Steam heated, 22 foot long oven for removal of moisture from paper filters used in acetate yarn manufacture at Tennesse Eastman Corp., Kingsport, Tennessee.*

READY TO USE when they reach your plant, production-size ovens are built, tested and shipped complete from the KIRK & BLUM plant. Your production through the oven starts just as soon as necessary connections are made . . . there's no tie-up for erection, testing or adjustment in your plant. You save time, money and avoid production delays.

From mammoth conveyor ovens for high production to the smallest of laboratory units, KIRK & BLUM builds many types of industrial ovens for a multitude of uses. Typical installations are shown in "Industrial Ovens" Booklet. Write for your copy today. The Kirk & Blum Mfg. Co., 2816 Spring Grove Ave., Cincinnati 25, Ohio.

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INDUSTRIAL OVENS

Company has long been a prominent warehouse distributor and mill representative for flat rolled steel products, specializing in tin plate, terne plate, and black plate, both plain and decorated, and steel sheets.

NEW POSITIONS

PHIL H. RICHEY has been appointed personnel director of Detrex Corp., Detroit 32, Mich., manufacturer of industrial cleaning processes, dry cleaning machinery, bakery silicone removal systems, and cleaning and rustproofing chemicals.

ELMER F. HINNER was recently named general manager of Hercules Powder Company's Virginia Cellulose Department in an announcment by C. A. Higgins, president. Mr. Hinner succeeds **LLOYD KITCHEL,** who died suddenly on June 30.

Mr. Hinner joined Hercules in 1927, and during most of his 23 years with Hercules has been associated with the department he now heads.

FOR SILVERSMITHS, PLATERS, JEWELRY MFGRS., ETC.

Supplied in brass, steel or nickel silver wire in sizes .0025 - .006 or bristle, Nylon or fibre.

Special sizes and shapes to order.

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DIXON & RIPPEL, INC. KINGSTON, N. Y.
ESTABLISHED 1856

Victor Kirker, president of the Kirker Chemical Co., Paterson, N. J., manufacturer of industrial finishes, has announced the appointment of **ANDREW X. LAUCHAIRE** to its sales force.

Andrew X. Lauchaire

Mr. Lauchaire joins the Kirker Chemical Company with a background in the industrial finishing field dating back to 1922.

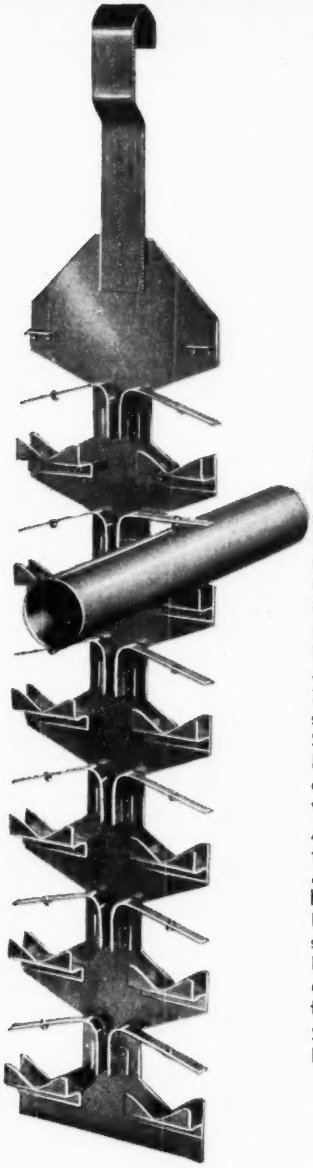
He is well known in Metropolitan New York, where he will continue to render personal service, as well as in parts of New England.

George L. Wirtz, president of The Atlas Mineral Products Co., Mertztown, Pa., has announced the following personnel changes:

RICHARD A. WEPPNER has been appointed sales engineer in Delaware, Maryland, Virginia, and parts of West Virginia and New Jersey. Mr. Weppner holds B.S. and M.S. degrees in chemical engineering from the University of Notre Dame and has had over 12 years' experience in sales and consultation in corrosion-resistant materials, solvents, coatings, and plastics. Prior to joining Atlas he was a sales engineer of corrosion-resistant products for the Pennsylvania Salt Mfg. Company.

PHILIP E. BERENS has been appointed sales repesentative in eastern Pennsylvania, western New York, and parts of New Jersey. Mr. Berens has served part of this territory for Atlas before and more recently has been located in the Detroit territory. He received his B.A. degree in chemistry from the University of Pennsylvania, and prior to joining Atlas was general manager of Electro-Chemical Supply and Engineering Company.

WILLIAM A. STREAKER has been appointed sales engineer in the lower peninsula of Michigan, eastern Indiana, and Lucas County in Ohio. Mr. Streaker received his B.S. degree in chemical engineering from the University of Illinois, and prior to this appointment was in the Atlas engineering department. Before joining Atlas he was associated with the General Electric Company.



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Anodizing Rack Insulation

PASTE

Single Coat Primer
One
Top Coat Baked

AIR DRY

No Baking
All
Tough Air Dry

BUNATOL

special insulation for aluminum anodizing racks and fixtures. Unusual adhesion to metallic aluminum and made to withstand the strongly acid anodizing solutions. Makes rack insulation a profitable investment because racks will last so much longer with repair costs greatly reduced.

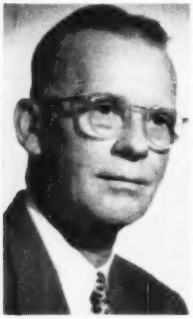
BUNATOL No. 796 is a new air-drying insulation for aluminum which, with a few coats, will give complete insulation coverage and protection. Thick liquid can be used by brushing or dipping. Permanently flexible with extra adhesion to stop seepage. Very tough to withstand cuts and abrasion. Synthetic resin base gives unsurpassed chemical resistance. No equipment necessary. Just clean the rack, apply a few coats and air dry.

Where a baking oven is available the use of the special Aluminum Primer and BUNATOL Paste No. 1002 will save time and labor. Just apply a single coat of No. X126 Primer and bake, and quickly dip a single coat of the Paste and bake; the entire operation in about two hours. The high gloss Paste is very thick and flexible and of extreme toughness to stand wear and shop abuse. Excellent chemical resistance. Designed to protect aluminum racks at very low over-all cost. No. 1002 Paste insulation will often last as long as the rack.

Save time and cost by insulating anodizing racks with BUNATOL. Get the facts—just write

Nelson J. Quinn Company
Toledo 7, Ohio

Dr. C. Klinkenstein, president of Maas & Waldstein, Newark, N. J., has announced the appointment of another sales engineer to the company's Eastern division.



I. T. Darlington

I. T. DARLINGTON has had almost 30 years' experience in research, development, and technical service of lacquers and synthetic enamels and is fully familiar with baking equipment and electroplating techniques. He will concentrate his efforts in the eastern Pennsylvania area, including Philadelphia, Baltimore, Maryland, and Harrisburg, Pennsylvania.

The Carboline Co., St. Louis, Mo., has announced the appointment of **R. A. DITTBRENNER** as its Eastern representative. Mr. Dittbrenner has been employed in corrosion work for the past 17 years.

In addition to being Eastern representative, Mr. Dittbrenner will handle the advertising and sales promotion for Carboline on its line of thermosetting and thermoplastic coatings and linings for erosion and corrosion service.

The Hanson-Van Winkle-Munning Co., Matawan N. J., has announced the appointment of **JAMES F. STOMBER** as administrative assistant. He brings to H-VW-M an excellent educational and business background pointing toward the financial and statistical duties to which he has been assigned.

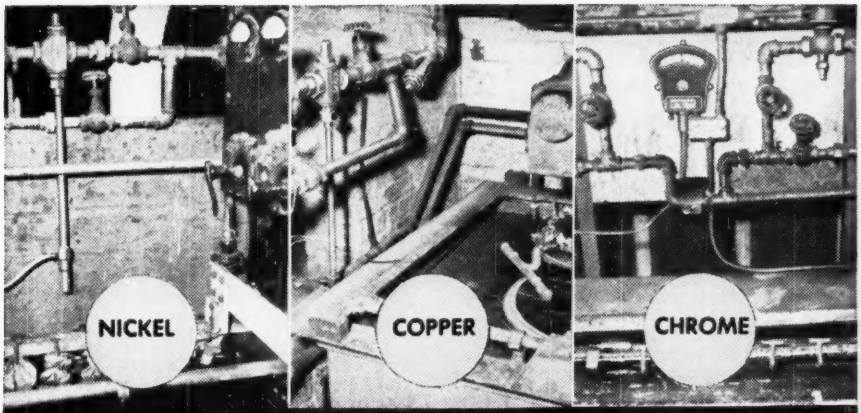
James F. Stomber

Mr. Stomber received his B.S. degree at New York University in 1943, majoring in foreign trade and marketing. After service in the Navy, he joined the Lee Higginson Corporation, where he was assistant to the vice president and comptroller as financial analyst.

Announcement has been made of the appointment of **NORMAN F. SMITH** as plant superintendent of the DeVilbiss Company, Toledo manufacturer of complete spray finishing equipment, air compressors and atomizers. For the past three years he has been chief process engineer with the Pyle National Co., Chicago, and served two years following the war as president of Namron, Inc., Chicago manufacturer of plastic advertising specialties. During the war he was a consulting engineer to several Midwest companies.

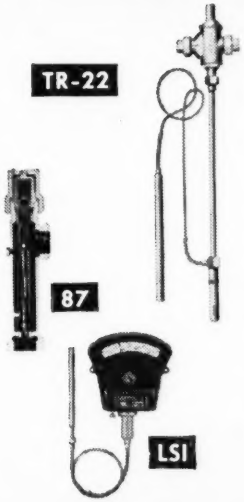
Norman F. Smith

BUILD A BETTER FINISHING DEPT.
Improved
DETROIT
HANDY "TAC" RAG
NON INFLAMMABLE
Switch to DETROIT "TAC" RAGS
and avoid rejects. Remove all dust, lint and sand quickly, efficiently. The standard for 16 years. Order from your supplier today, or send for sample.
FLAME RESISTANT
DETROIT
HANDY "TAC" RAG
DETRO MFG. & SALES CO., INC., CULVER CITY, CALIF.



PRECISION PLATING

With 3 Sarco Temperature Controls



Any plating engineer knows exactly what he wants in temperatures for the various jobs going through his plant. Few realize that the very controls he needs are waiting for him and can be installed quickly at comparatively little cost.

Starting with the wash tanks he can get a suitable control in the Sarco 87 Thermoton for the cost of a good steam trap.

For greater refinements in control the Sarco TR-22 illustrated and the Sarco TR-21 control are available. For chrome he can add automatic cooling at little cost.

For most plating jobs he can keep temperatures within a degree or two with the inexpensive Sarco LSI Electric Controls.

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SARCO SAVES STEAM

SARCO COMPANY, INC.
Represented in Principal Cities
Empire State Building, New York 1, N. Y.
SARCO CANADA LTD. TORONTO 5, ONTARIO

HONORS

DR. EDWIN O. BARSTOW, vice president of The Dow Chemical Co., Midland, Mich., observed his 50th anniversary with the company on June 13.

Joining the Dow staff as a chemist three years after the firm's incorporation, Dr. Barstow distinguished himself for executive as well as technical ability, and in 1914 became production manager of Dow's rapidly expanding inorganic chemicals division.

Some 58 patents attest Dr. Barstow's contributions to chemical science. He has been active in the development and production of a wide range of chemicals including the extraction of bromine from sea water. His association with the company's magnesium development has been such that he has been referred to as the "father" of the American magnesium industry.

Dr. Barstow became a director of The Dow Chemical Company in 1931 and a vice president in 1941. A graduate of Case School of Applied Science, he received an honorary Doctor of Engineering degree from his alma mater in 1941.

ALBERT P. BINGHAM, divisional director, Pittsburgh Plate Glass Co., Newark, N. J,. has been awarded an honorary certificate in recognition of his development work on industrial standards.

Mr. Bingham has been a member of the ASA Standards Council for the past 3½ years, representing the National Paint, Varnish and Lacquer Association. The Association is one of the 101 national technical societies and trade associations that work together in ASA.

SOCIETIES

At the Fifth Annual Meeting of the members of the **FINISHERS' TRADE INSTITUTE** held in June at the Graemere Hotel in Chicago, the following officers were elected for one year:

President, W. E. Smith, Enamelers & Japanners Company; vice president, Curtis G. Peterson, Air-Art Finishing Company; secretary-treasurer, W. B. Swedlund, A B C Enameling Works; and director, H. P. Brettman, Jukes & Shafer, Inc. Continuing in office as a director is C. A. Benjamin of the Novelty Imperial Japanning Company; the retiring director is H. M. Lavin of Japanning Specialties Company.

The elementary **COURSE IN PAINT TECHNOLOGY** sponsored by the **PAINT AND VARNISH PRODUCTION CLUB** and the **PAINT, VARNISH AND LACQUER ASSOCIATION OF BALTIMORE** has recently been completed by 25 students at Johns Hopkins University under the direction of Ross Shurts. This is the third annual course which has been successfully terminated.

Next September an advanced course will be offered under the supervision of

NEWEST DEVELOPMENTS IN METAL CLEANERS

DU-LITE NO. 31 & 37

FOR SUPERIOR METAL CLEANING

31

A highly efficient cleaner, especially for the electrolytic cleaning of steel and all ferrous alloys prior to electroplating. Also may be used as a soak cleaner or a combination of soak and electrolytic. Compounded exclusively by Du-Lite for removing grease, oils, and drawing and buffing compounds. Economical in use and in price.

37

Du-Lite has perfected this new all purpose cleaner to be used as a soak, electrolytically, or both in combination for all metals, except aluminum. Du-Lite No. 37 is especially recommended for the cleaning of stainless steel, steel, zinc, nickel plate and brass. Will not tarnish die castings or brass. Competitively priced.

Du-Lite Cleaners No. 31 & 37, products of the Du-Lite Research Laboratory, have been thoroughly tested on regular run shop work, and are backed by Du-Lite's long experience in metal cleaning and finishing.

Write for trial order or call for the Du-Lite field engineer to discuss procedures for your particular problem.

THE DU-LITE CHEMICAL CORPORATION

100 RIVER ROAD • MIDDLETOWN • CONN.

Ross Shurts and fifty or more students are expected to enroll. More laboratory work will be required than heretofore, with both the University and paint companies cooperating.

New president of **THE ELECTROCHEMICAL SOCIETY** is Dr. Charles L. Faust, head of electrochemical engineering research at Battelle Institute, Columbus, Ohio. R. J. McKay, chemical engineer for the International Nickel Company, has been elected a vice president.

Dr. Charles L. Faust

Other officers of the Society are: vice presidents, Dr. Ralph M. Hunter, manager of Dow Chemical Company's electrochemistry division, and Dr. J. C. Warner, president-elect of Carnegie Institute of Technology; secretary, Dr. Henry B. Linford, associate professor of chemical engineering at Columbia University; and treasurer, E. G. Widell, R.C.A. Victor Division, Radio Corporation of America. Immediate past president is A. L. Ferguson, professor of chemistry at the University of Michigan.

The Society's new president has a long record of scientific service. In addition to other important achievements, Dr. Faust has been a pioneer in the development of electropolishing methods used on such items as automobile and refrigerator trim. Dr. Faust will also head the Society's board of directors.

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At its annual meeting at Hot Springs, Virginia, the Industrial Furnace Manufacturers' Association elected **HENRY M. HEYN** to serve as president for the current year.

Henry M. Heyn

Mr. Heyn, who is sales manager of the Heat Treat Division of Surface Combustion Corp., Cleveland, Ohio, has been active in IFMA for many years, serving on numerous committees. He has been particularly active in the industrial mobilization work of the Association.

TRAINING COURSES

In response to continuing demand, the **DEPARTMENT OF CHEMICAL ENGINEERING** of **NEW YORK UNIVERSITY** will again offer a series of graduate courses in Surface Technology. Given by Dr. Max Kronstein, the courses are as follows: **Surface Finishes, Surface Finishes Laboratory,** and **Research.**

Additional information may be obtained from Henry J. Masson, Assistant Dean, in charge of the Graduate Division, New York University, College of Engineering, University Heights, 53, New York.

NECROLOGY

Announcement has been made of the death on August 7 of **HAROLD S. ARNOLD,** technical assistant to the president of The International Nickel Co., Inc., New York, New York.

Mr. Arnold joined International Nickel in 1914 and served in various executive capacities, including management of the Huntington, West Virginia Works. He was a member of the American Institute of Mechanical Engineers, Mining and Metallurgical Society of America, American Iron and Steel Institute, American Society for Testing Materials, American Chemical Society, Navy Industrial Association, and the American Mining Congress and Mining Club of New York.

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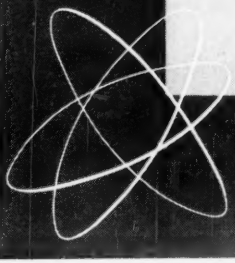

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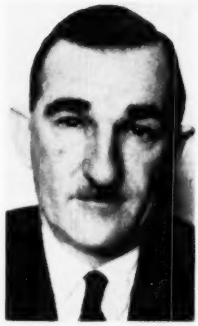
EDWARD LEO GANN of the Hanson-Van Winkle-Munning Co., Matawan, N. J., passed away June 30, at 58 years of age.

Beginning his career with the company by sweeping the floor, Mr. Gann became one of the outstanding practical electroplating experts of America. As an electroplating trouble-shooter, he had no superior.



Edward Leo Gann

Comet Air-Stream Unit Heater, its specifications, features, and advantages are described and illustrated in **Bulletin 485** issued by The New York Blower Co., 3166 S. Shields Ave., Chicago 16, Ill. Typical piping connections are shown by means of line drawings.

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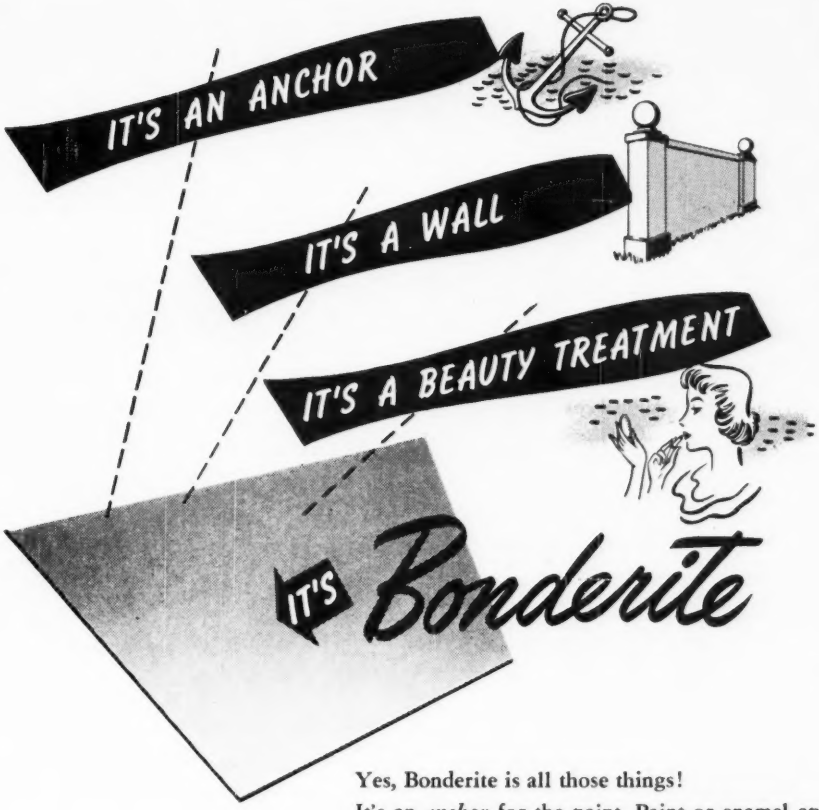

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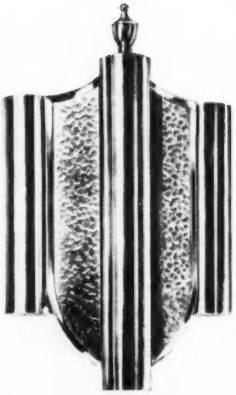
Finishes

Hotpoint's new "glamour" line of electric commercial ranges and ovens is finished in a durable silver gray hammer-type aluminum finish called Permaluscent. A special primer is sprayed on clean, cold rolled steel and is followed by a spatter coat of baking enamel.

(Photo courtesy Hotpoint Inc., Chicago 44, Ill.)



The NuTone Model K-20 "Mt. Vernon" two-door chime here illustrated is manufactured from hammered and polished brass, and coated with a clear synthetic baking finish.

(Photo courtesy NuTone, Inc., Cincinnati 27, Ohio)

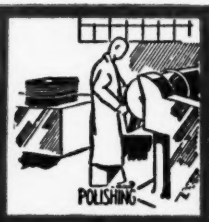
that aid in appearance and utility

The microscope tube of the Buhl Wide Field S-186 Microscope is brass finished in bright hard chromium plate. The optical system of the model renders a well defined image of a wide flat field.

(Photo courtesy Buhl Optical Co., Pittsburgh 12, Pa.)

The Electri-conomy, Remington Rand's 1950 electric typewriter, has a chip-resistant gray wrinkle finish, black plastic keys, and bright nickel plated guide and control devices.

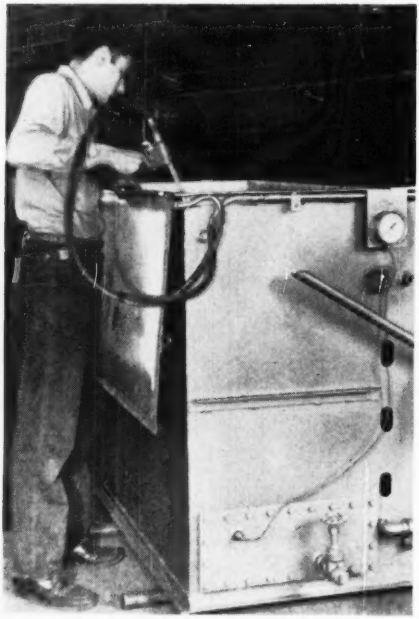
(Photo courtesy Remington Rand Inc., New York 10, N. Y.)



New • EQUIPMENT • MATERIALS • PROCESSES

Model MP 120E Vapor Degreaser

Product of the Manufacturers Processing Co., P. O. Box 6, Detroit 20, Mich., the Model MP 120E Vapor Degreaser is designed not only for the normal function of soil removal by vapor condensation but is also equipped with a special lance so that the operator may spray solvent directly on the part being degreased.



Model MP 120E Series 48 Degreaser in use

Advantages pointed out by the manufacturer include the following:

(1) An extra large removable water separator (located in the storage and condenser tank) ensures water-free solvent at all times. (2) The Model MP 120E Degreaser has been designed with its work area free of all obstructions since condensing surfaces are all located in the condenser. (3) The spray lance is equipped with a pistol grip trigger-type switch so that the operator can control the spraying operation easily. (4) Standard controls are used on the degreaser and have been so selected and located that necessary adjustments and normal maintenance can be performed easily. (5) Since there is no water jacket located around the body of the machine, the overall height of the degreaser is less than would otherwise be necessary. (6) Since there is no water jacket area which might be subjected to corrosive sweating under conditions of high humidity, the possibility of failure of this portion of the unit due to corrosion has been elminated. (7) The degreaser may be converted at any time from a steam heated unit to a gas or electrically heated degreaser.

E-Kon-O-Kote

Paint booth masking material designated as Crescent E-Kon-O-Kote has been developed by the Crescent Chemical Corp., Perth Amboy, N. J. Similar in many respects to the company's Booth Mask, E-Kon-O-Kote provides an un-

usually white surface which makes possible better illumination in the paint spray booth.

The booth masking material is also easily removed, economical, and readily applied. Crescent E-Ken-O-Kote is said to be non-dusting and highly efficient in the performance of its function.

Semi-Plastic Drawing Compound

Known as "Fluid Film," a drawing compound that is said to maintain its inherent physical properties during repeated forcible stamping of ferrous and non-ferrous alloys has been announced by the Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich. A complex semi-plastic composition, it has high film strength and does not separate even under intense stresses, the manufacturer claims. Moreover, it is claimed that the electrical properties of the molecules at the interface between the lubricant and the metal surfaces remain constant during the drawing operation because of the chemical and physical stability of the compound.

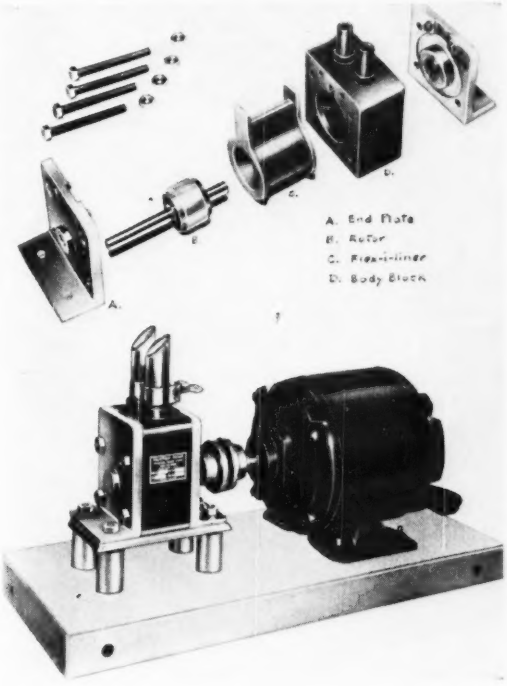
Fluid-Film is unaffected by atmosphere, its complex organic molecules resisting chemical and physical deterioration. Neutral in pH, the compound leaves no heavy residue or stain on the surface of any alloy and can be easily applied by the brush, spray, roll, or dip method. Made in non-pigmented form only, the compound is claimed to air-dry within minutes and force-dry in seconds. The high free surface energy of its particles provides a stability that is said to prevent phase separation. Thus, the compound may be stored indefinitely.

Vanton Pump

A non-corrosive "flex-i-liner" pump in which the transferred liquid or gas never touches any of the metal parts has been developed by the Vanton Pump Corp. Empire State Bldg., New York 1, N. Y. The unique design of the pump is claimed to make it particularly suitable for handling corrosive liquids such as acids, alkalis, industrial alcohols, as well as many corrosive gases.

The construction of the pump is such that the fluid flows on the outside of the "flex-i-liner" and on the inside of the body block. The "flex-i-liner" material can be specified in either a pure gum rubber or a synthetic, depending on the particular application, while the body block can be obtained in a special corrosion and abrasion resistant Bakelite. An eccentric rotor mounted on a ball bearing rides inside and activates the "flex-i-liner". The "squeegee" action thus created is the basis of the pump operation.

In addition to its non-corrosive feature, the Vanton Pump is said to be of the positive displacement type and self-prim-



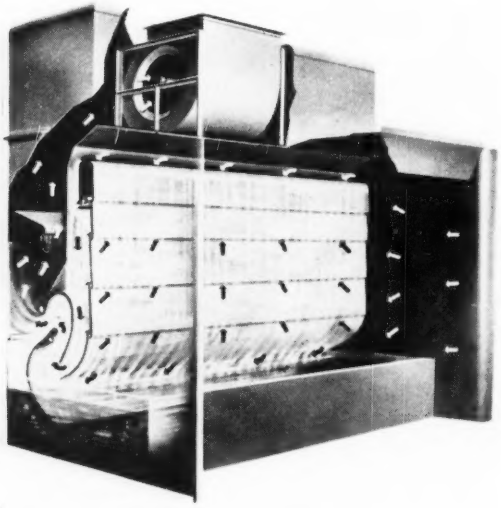
Vanton Pump, showing essential parts (above) in an exploded view, and complete assembly, mounted and ready for use (below).

ing. The possibility of external leakage and contamination by oil or grease is avoided by eliminating glands or stuffing boxes from the design of the unit. Maintenance is simple, with infrequent replacement of the "flex-i-liner" being the only pump service necessary. This can be done without having to remove any pipe lines or attached equipment. The unit is small and compact, and is available in five models from 20 to 300 g.p.h. Special features such as variable speed, explosion proof, or totally-enclosed motors can be included.

Uni-Flow Flood Sheet

Newcomb-Detroit Co., 5741 Russell, Detroit 11, Mich., announces its Uni-Flow Flood Sheet for its Roto-Wash Spray Booths which permits intake of paint-laden air through the water curtain. This not only increases the amount of intake area but also assures more efficient intake because of more uniform air flow inside the spray booth enclosure.

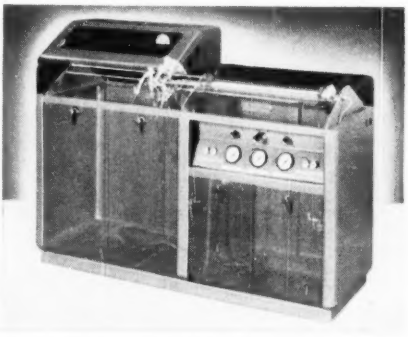
Air is drawn through the water curtain and into the washing chamber through a series of horizontal slots extending across the face of the flood sheet. The sheet is sturdily constructed and is hinged at the top for easy access to all interior surfaces for simplified maintenance when required. If desired, the Roto-Wash Spray Booth can also be supplied with the conventional, solid flood sheet.



Roto-Wash Spray Booth with Uni-Flow Flood Sheet

Automatic Spray Painting Machine

An Automatic Spray Painting Machine for use with standard types of spray masks, designed to apply paint finishes



Automatic Spray Painting Machine

and decorative designs to metal stampings, plastic products, die castings, and similar products and parts at production line speed, mechanically and automatically has been developed by Sepanski & Associates, 409 Henry Ave., S.E., Grand Rapids, Michigan.

Such pieces as decorative name plates, escutcheons, counter displays and others that are to be finished in more than one color, even though one of the colors is a very simple operation and the others involve intricate angles, depressions or raised portions that have to be covered unifomly, may be handled with equal ease and at the same speed of production by this machine, the manufacturer states.

Work to be painted is pressed against the spray mask which is semi-permanently installed in the spray opening. The operator then presses a foot valve that activates the spray cycle.

Within the machine, pneumatic power moves two automatic spray guns parallel

to the surface being painted to apply an even coating. Adjustable to any desired spray density, these guns can be set to any angle from 0 through approximately 30 degrees in any direction and can be regulated to automatically alter the angle of application during transit to assure an even distribution of paint to flat and recessed or raised portions of the surface, as well as to sides and corners of depressions, and around mask bridges without shadowing.

Both the length of the stroke and the speed of operation can be accurately controlled to provide a uniform coating in both directions, or for heavy coverage in one direction and lighter spray on the return stroke, it is claimed.

Timers mounted in the machine assure a full cycle coverage throughout the day and week.

Advantages claimed for this machine over manual spray painting include uniformity in quality and speed of production, elimination of cumbersome clamping and holding devices, higher speed of operation, less floor space required. Also, much smaller spray masks can be used since it is not necessary to block off areas other than that immediately surrounding the portion that receives the paint.

Except for a suitable exhaust duct, air line connection and paint supply, the unit is entirely self-contained and all spray and fumes are confined within the machine.

Three standard units provide spray areas 12, 18, and 24 inches long and 6 inches wide, although in some types of work the full 8-inch width of the mask opening can be used successfully.

"Gun Guard" Oil Spray

A rust preventive oil and lubricant known as "Gun Guard" and packaged in an Aerasol container for spray application to metal parts and fabrications in storage and production, guns, firearms, tools, implements, and so on, has been introduced by The Mitchell-Bradford Chemical Co., 2446 Main St., Stratford, Connecticut.

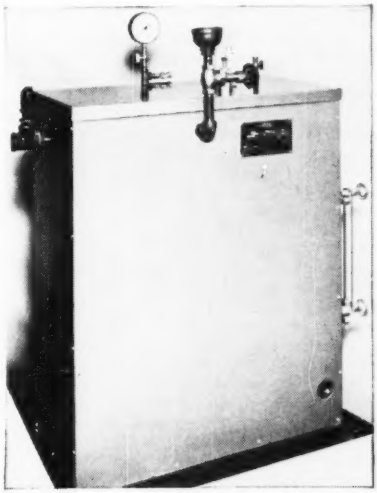
According to the manufacturer, Gun Guard Oil, due to its excellent corrosion resistance characteristics and spray application, is ideal for industrial use by reason of the speed and ease with which it can be applied without the necessity of having to lift or move the items to be treated. Parts or assemblies in storage bins or production lines can be easily and conveniently sprayed with the oil.

The oil is a polarized type and will displace any wetness or dampness on the metal surfaces, resulting in longer corrosion resistance. Because of the spray application, the oil will reach areas, especially in assembled mechanisms, which normally are hard to reach.

Speedylectric Boiler Model 400

A new electric steam boiler has been announced by Livingstone Engineering Company, 100 Grove Street, Worcester, Massachusetts, manufacturer of Speedylectric Boilers and Steam-Jet Cleaners. Designated as Model 400, the boiler has a maximum working pressure of 50 p.s.i., and is available in standard sizes from 3 Boiler horsepower to 25 Boiler horsepower. The Speedylectric "400" can be operated on 220, 440, or 550 volts, single or polyphase. It is built to the ASME Code specifications, and is National Board inspected and stamped. Insurance Company certificate of Boiler Shop Inspection is issued for each boiler. The "400" is Underwriters' Laboratories listed and carries the UL Re-examination Service Seal.

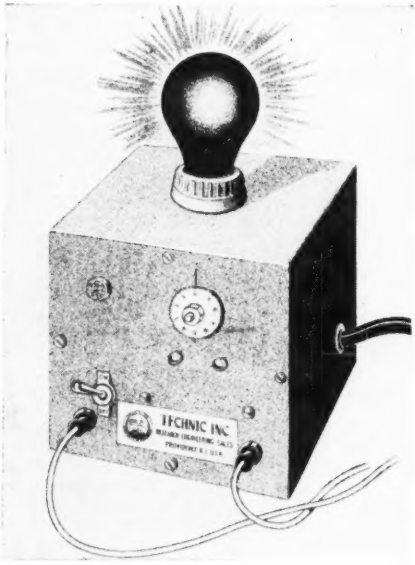
The Speedylectric "400" is finding many applications in process heating of plastic presses, jacketed kettles, autoclaves, pressing machines, rubber rolls, degreasers, and other steam-using equipment.



Speedylectric Boiler Model 400

"Techni-Timer"

Technic Inc., 39 Snow St., Providence, R. I., has announced the development of an automatic timing control for the plating of rhodium, gold, and gold alloy solutions. Called the "Techni-Timer," the unit, which is only 6 inches square, can be set up and operating in less than a minute. After being plugged into an electrical outlet, lead wires are clamped to the tank rheostat. The operator then sets the dial for the desired plating time. After this initial setting there is no need to reset unless a cycle change is required.



"Techni-Timer"

Insertion of the work in the tank automatically starts the timing cycle. Completion of the cycle is signaled by a red light. Removal of the work automatically resets the timer to the same cycle, ready for the next batch.

According to the company, the timer takes the guesswork out of short cycle timing and eliminates the setting of audible timers. It is also claimed to cut plating costs by preventing overplating; cuts operating time and speeds batch output by doing away with manual resetting. Its automatic action does not interfere with or cut off plating current.

Flameless Electric Torch

The Kinetic Corp., 31 S. 18th St., Philadelphia 3, Pa., has announced full porduction of its Heat Gun. The Thermal-Jet Flameless Electric Torch, utilizing the radiant electric heat principle originated by Kinetic engineers for hand torches, has a one-piece aluminum jacket, with 3-inch orifice, a high speed, heavy duty, replaceable electric unit, and a pistol grip handle with an 8-foot U.L. approved heavy duty cable. The gun can be used with 115 volt current. Total weight is approximately two pounds.

The manufacturer states that the penetrating, radiant heat projected by the Thermal-Jet will reduce multi-layers of paint, enamel, or varnish to a dry, flaky ash which can be removed in one stroke as fast as a professional painter can use a scraper. It is further stated that, if desired, paint can be removed without disturbing undercoat, filler, or caulking. The Heat Gun is used like a blow torch but does not burn or scorch the surface, thus permitting it to be used on canvas covered surfaces, as well as on metal or wood.

A wide variety of high-heat uses are claimed for the Thermal-Jet, including removing paint from spray and conveyor equipment, spot heating in chemical and industrial processing, annealing light metals, laboratory experimental work, and so on.

Thermal-Jet Flameless Electric Torch

Model 7VT Dissolver

The Cowles Co., Inc., Cayuga, N. Y., has announced a dissolver, Model 7VT, which works batches of 5 to 100 gallons

Model 7VT Dissolver

of material ranging in viscosity from 1 to 30,000 centipoises. Though rugged and compact, it is a flexible machine. The entire motor, bridge, and dissolver unit may be adjusted in height through a range of 11 inches by means of an elevating screw, thus making the unit adaptable to containers of varying depth. The bridge support can be tilted through an angle of 60 degrees for quick removal of the impeller from tanks, a manual operation that is aided by two compression springs which act as snubbers and boosters.

A 5 h.p., explosion-proof motor is on the bridge. The drive assembly is mounted on a slide plate to permit horizontal movement, which affords a wide selection of sheave ratios and speeds, and therefore the use of selected groups of impellers which are supplied with the unit. Spark-proof V belts are used to connect the motor with the impeller shaft.

Additional, specially designed impellers, all of which are stainless steel, are available for unusual jobs. Charts for the selection of size and rim velocity of impellers are provided, and batch sizes are determined as a function of the viscosities and flow characteristics of the materials treated.

Tygon Flexible Tubing

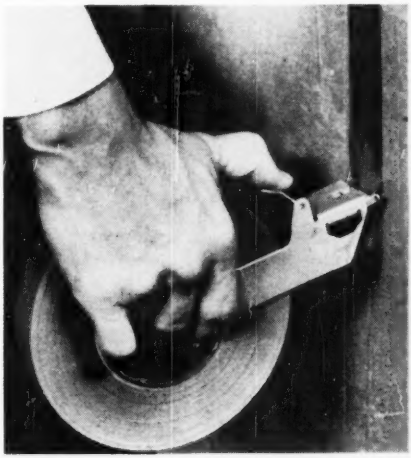
Corrosion of electrical wire and cables in the plating and pickling rooms is said to be prevented by encasing them in Tygon Flexible Tubing, product of the U. S. Stoneware Co., P. O. Box 350, Akron 9, Ohio. In addition to being fully resistant to the action of all the corrosive fumes and solutions encountered in metal finishing plants, Tygon is also claimed to be non-oxidizing, non-hardening, and non-aging.

Tape Hand Dispenser

A hand dispenser for dispensing lengths of tough tear-resistant filament tapes has been announced by Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Called a "Scotch" Brand Filament Type Hand Dispenser, the all-metal unit is designed for use with "Scotch" brand filament tapes and other hard-to-cut tapes.

Main feature of the dispenser is a razor-sharp cutting edge. A thumb-operated trigger presses the cutting blade against the tape to make the cut. When the trigger is released, the blade retracts so that it cannot cut accidentally. Dulled blades, the manufacturer states, can be changed as easily as safety-razor blades.

The dispenser can be used with tape



"Scotch" Brand Filament Tape Hand Dispenser in use

rolls up to 72-yards in length, and accommodates tape widths from ½ to 1-inch. Both the dispenser and filament tapes are available from paper jobbers nationally.

Syphon Breaker

An interesting and useful "widget" supplied by the Hanson-Van Winkle-Munning Co., Matawan, N. J., is a syphon breaker to prevent the pollution of water supply by eliminating back syphonage of water from open cleansing tanks.

H-VW-M Syphon Breaker

The device allows atmospheric air to mix with water discharging at bottom of the tank, agitating the water. It also saves water, thereby reducing operating costs, the company states.

Arco Insulated Grommet and Spreader Pliers

Announcement has been made of a metal formed grommet completely covered with rubber. It is designed for insulating blanked holes in metal to prevent cutting, chafing, shorting, and rattling of wires, cables, conduit, tubing, and so on, which pass through the holes. The grommet is called the Arco "Sta-Put" Series 3120 and is manufactured by Automotive Rubber Co., Inc., 8601 Epworth Blvd., Detroit 4, Michigan.

Principal advantages of the "Sta-Put" Grommet are that it can be installed easily and quickly and it remains in position at all times. Regardless of the amount of motion or vibration in the part that passes through the hole, it will not loosen or pull out exposing the sharp edges of the blanked metal, it is claimed.

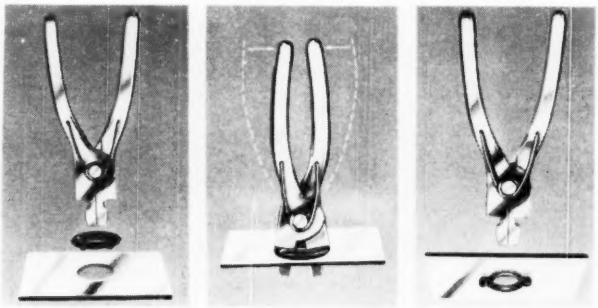
Installation from the face of the hole is another feature of the "Sta-Put" Grommet. An expanding hand tool made available by the company is used to roll and force the curled prongs tight against the under-surface, assuring a positive secure fit.

Lightweight Colored Aluminum Chain

A group of styled chains, made of aluminum and finished by means of Mirrodip JF Electrodized processes to simulate Gold, Silver, Nickel, Brass, Copper, Chromium, red, blue, gray, green, brown, black, and the various pastel shades, has been developed by Colonial Alloys Co., Philadelphia 29, Pennsylvania.

The finished chain surfaces have a higher corrosion, abrasion and hardness resistance, and in comparative tests have been found to outwear any of the electroplated or lacquered finishes, it is claimed.

Colonial chain is about two-thirds lighter in weight than the same styles in



"Sta-Put" Series 3120 Grommet (left); (at right) three steps in grommet installation with Spreader Pliers.

brass or steel. From the smallest diameter of bead types to the largest Elwel twist type of wire chain it is processed in long lengths and packaged in hanks and on spools.

Miskella "Dri-Water"

Product of The Miskella Infra-Red Co., E. 73rd & Grand Ave., Cleveland 4, Ohio, Blue Dri-Water Concentrate is used to replace ordinary water for rinsing metal and other solid materials, reducing the drying time and the heat needed to completely dry off the surfaces for further processing. Solid objects made of metals, plastics, and various compositions show no droplets, globules, or stains whatever. A light, uniform coating of water approximating a fog blown by one's breath on a cold surface results, and this can be dried almost instantly with a short, low-capacity, infra-red oven.

Applied by dipping spraying, brushing, directed to the work by flo-coat or by needle point showerbath technique, or fed into running water automatically, Dri-Water can be used in connection with any infra-red oven.

Glass Immersion Heater

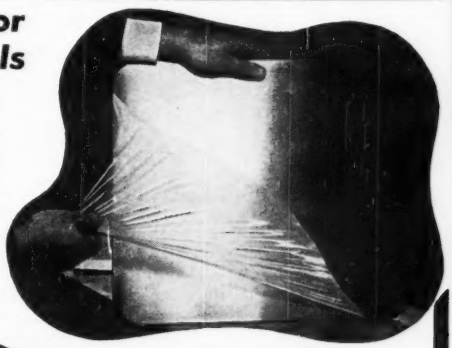
An immersion heater said to be ideal for heating plating solutions or oil baths is being marketed by The Glass-Quar Co., 90 Manhattan Ave,. Brooklyn 6, N. Y. Various models of the heater are available, made either of quartz, Pyrex, or Vycor heat resistant glass. The electric heating element is sealed between two layers of glass in the heater after the air has been exhausted. The manufacturer states that very rapid thermal response may be obtained with the heater because the heating element is operated in a vacuum.

Advantages claimed for the immersion heater

Glass Immersion Heater

A Strippable Plastic for the Protection of Metals

Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.



THE STRIPLASTIC COMPANY

Among many advantages, it is non-toxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

10828 QUEBEC AVE.
CLEVELAND 6, OHIO

include excellent corrosion resistance to most acids, excellent service life for the heating elements because of the absence of air, uniform heating throughout the length of the heater, construction features which make possible a cool top portion while the bottom part of the heater is in full operation.

Special models of the Glass Immersion Heater are made for service where rough usage may be encountered by copper or nickel plating the glass heater tube.

Cable Conveyor Drive

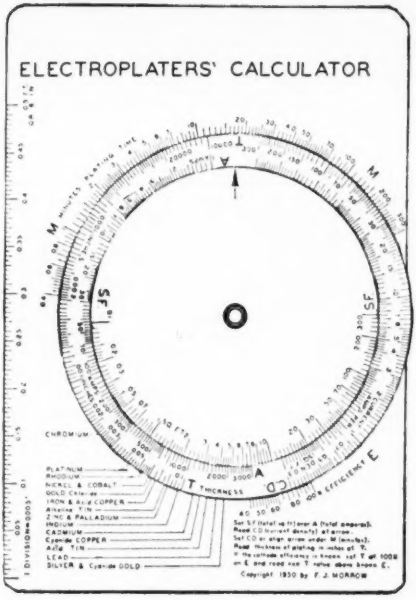
A compact, simplified Cable Conveyor Drive Unit with a rated pulling power of 500 pounds has been added to the "Universal" Overhead Trolley Conveyor line by The E. W. Buschman Co., Cincinnati 32, Ohio. The unit will drive a conveyor installation carrying a load as much as thirty times its rating.

The "Universal" drive has a 2.25 to 1 ratio Reeves variable speed unit. Power is applied to the conveyor drive shaft through a vertical gear reducer selected to provide the required conveyor speed. The drive shaft is carried on widely spaced Timken bearings for added stability. The interchangeable 5-gap drive sheave is easily removable from the bottom of the shaft.

The unit is equipped with either a friction safety clutch V-sheave or a safety overload shear pin drive sheave. Spur drive gears are guarded for safety.

Electroplaters' Calculator

Morrow's Electroplaters' Calculator is a precision device designed by F. J. Morrow, 288 Montgomery St., Bloomfield, N. J., to solve total plating area, total amperage, current density, plating time, and



Morrow's Electroplaters' Calculator

plating thickness for nineteen types of plating baths. The device also has an auxiliary scale for calculating the actual thickness from any known cathode efficiency.

For specification plating, calculations can be quickly made to obtain amperage and plating time for any required thickness between 0.00001 and 0.01 inch.

A six-inch ruler, calibrated in fractions of a foot, permits area computations to be made on small parts without square inch to square foot conversion. The calculator is pocket size, printed on durable paper stock, with ample room at the top and back for the user to write job notations and other pertinent data.

Un-i-loid Hammer-Effect Finish

A one-coat hammer-effect finish, known as Un-i-loid, which may be sprayed on metal items at the same pressure as regular enamels, has been perfected by the United Lacquer Manufacturing Corp., 1001 W. Elizabeth Ave., Linden, New Jersey.

One coat of the enamel, when sprayed

GOLD PLATING SOLUTIONS

In All Colors

Guaranteed 100% Pure Gold Content
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Tarnish Resistant
Proven Quality by the Acid Test

Write or call our experts about your plating problems

Davis-K-Products Co.

54 West 22nd St., New York 10, N. Y.
Oregon 5-0094
5-0095

at standard enamel pressure, immediately produces a hammer effect with a smooth, lustrous appearance. Excellent results have been obtained, the company states, in extensive tests on oil burners, refrigeration equipment, sanitary containers, and other metal items.

Un-i-loid is available in a full range of colors, and is available in either a bake or an air dry finish. Baking time is 20 minutes at 300 deg. F. in a gas oven, or 8 minutes under infra-red lights. Air dry Un-i-loid is dust-free within a few minutes and can be handled within an hour; it will dry hard overnight, the manufacturer claims.

Leader Industrial Mixer

Leader Industrial Mixer for heavy solutions, marketed by Leader Industrial Mixer Co. 3616 N. Cicero Ave., Chicago 41, Ill., is electrically driven, portable, and requires no other installation than to plug into the nearest electric outlet. It mixes in less than five minutes, thoroughly and uniformly.

According to the manufacturer, the unit is light in weight and so simple no maintenance is necessary. It cleans easily. Motor cover, shaft, and blades are a unit and are removable without tools. A baffle on the inside wall of the container breaks up particles in the mix and prevents over-surging at high rotor speeds. Handles are provided on both pails and motor-housing for quick and easy handling.

Detrex 70 Cleaner

Detrex Corp., Box 501, Detroit 32, Mich., has developed its Detrex 70 Heavy Duty Cleaner for cleaning steel prior to vitreous enameling.

As an immersion cleaner for steel, the following advantages are claimed for Detrex 70: it is fast; it holds its strength in solution, thereby reducing make-up requirements; it possesses exceptional detergency on all types of soil; it is non-sludge forming, as it is completely soluble in hot water even at high concentrations; it has the ability to emulsify large quantities of oil and prevent carry-over into subsequent stages of the process; it may be boiled continuously in solution without chemical breakdown; and it is extremely free rinsing.

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Built to Specifications

66 YEARS OF TANK BUILDING SERVICE

Plating and pickling tanks built to your specifications is a Kalamazoo specialty — any size or shape — fir, oak, cypress or redwood.

Tanks on left were made for large manufacturer of automobiles. They are 88" x 64" x 62" — made of 8" long-leaf yellow pine with B & M anti-acid metal tie rods.

Write today for estimates and suggestions.

Kalamazoo TANK AND SILO COMPANY

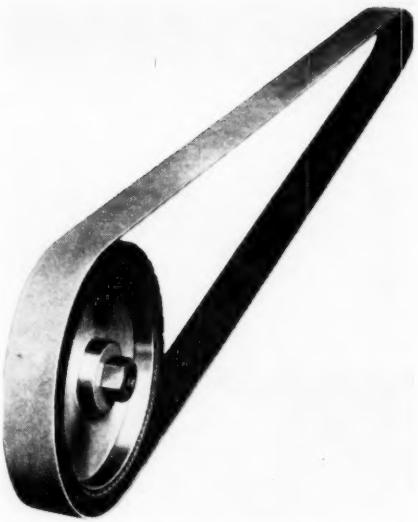
928 HARRISON ST. • KALAMAZOO, MICH.

Pennsalt Aluminum Etching Compound

Pennsalt AE-18, a highly concentrated alkaline compound for etching aluminum without forming hard sludge deposits on the bottom of etching tanks, is being offered by the Special Chemicals Department of the Pennsylvania Salt Manufacturing Co., 1000 Widener Bldg., Philadelphia 7, Pennsylvania.

The etching compound is the result of considerable research at Pennsalt's Whitemarsh Research Laboratories to develop a product which would give a bath of long life, assure uniform etching, and at the same time avoid the rock-like sludge deposits. Research work was followed by extensive field tests.

Packaged in a 300-pound non-returnable drum, Pennsalt AE-18 is recommended for use in concentrations of five to seven ounces per gallon of water at temperatures of 140 to 150 deg. F. Depending upon the degree of etch desired, the parts may be immersed for 30 seconds to 10 minutes, followed by rinsing in a clear water dip or spray.



Rayon-Resin Polishing Belt

Rayon-Resin Polishing Belt

Industrial Lubricants Co. Inc., 14459 Wildemere, Detroit 6, Mich., has been appointed distributor for the Rayon-Resin Polishing Belt which can be used and reset up to 1000 times.

Construction of the belt is said to ensure complete flexibility with only two per cent stretch or shrinkage and absolutely no raveling. The polishing side is rayon vulcanized to the oil-resistant Neoprene pulley side. A special splice ensures smooth running operation without kick.

The Rayon-Resin Polishing Belt is available from 2 to 40-inch widths and from 96 to 168-inch lengths.

Finish Stripper and Cleaner

Developed by the London Chemical Co., 607 Dearborn St., Chicago 5, Ill., Loncoterge No. 2063 is a rapid stripper of high baked acid and alkail-resistant finishes and will also rapidly remove carbonized films and hard-caked buffing compounds. Without resorting to solvents, it is said to strip the most difficult finishes, including baked japan, in two to five minutes.

Loncoterge is used at 155 to 225 deg. F., either as received or as a water dilution, depending on the type of finish to be removed. It may be part of a conveyorized

McKeon's

"Liquid Sulphur"

"THE OXIDIZING AGENT OF TODAY"

For stripping copper and producing various oxidized finishes on copper and silver.

Economical. Simple to use.

Order 5 gal. on trial and approval

Sulphur Products Co., Inc.

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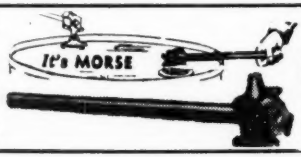
Send NOW for this FIT-ALL DRUM PLUG WRENCH

Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



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SATISFACTION GUARANTEED... $2.60

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painting cycle so that rejected parts can be rapidly stripped and re-cycled to the paint spraying booths and ovens.

PRODUCT LITERATURE

The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

Industrial Corrosion Test Cabinets. Industrial Filter & Pump Manufacturing Co., 5904 Ogden Ave., Chicago 50, Ill., has issued a revised catalog page on its test cabinets that are used for accelerated testing of the corrosion-resisting qualities of coatings on metal products. The literature gives detailed description of applications, design features, and the principal specifications of the different size models.

Enthone Ebonol Blackening Processes. An eight-page, well illustrated bulletin which includes a discussion of blackening baths for copper, brass, zinc, and steel is available from Enthone, Inc., Dept. P. F. 442 Elm St., New Haven, Connecticut.

Miccroloid Primer. A detailed bulletin giving complete information and instructions for the use of Miccroloid Primer, a bonding method for all metal finishes, may be obtained from the Michigan Chrome & Chemical Co., 6340 E. Jefferson Ave., Detroit 7, Michigan.

Bar-L Degreaser Leaflet. An illustrated leaflet describing its portable barrel vapor degreaser, designed for use in a 55-gallon solvent drum, is available from Manufacturers Processing Co., P. O. Box 6, Detroit 20, Mich. The leaflet mentions a number of uses for the degreaser, which employs trichlorethylene solvents, and offers complete instructions for the application of the product.

STOP RUST AND CORROSION

with

PHOSCOTE

- A new type phosphating cleaner that cleans and phosphates in a single operation.
- Prevents under film rust and corrosion, adds life to the finished item.
- Produces a fine, evenly dispersed phosphate coating on the metal surface for greater paint adherence.
- Is a non-toxic, non-corrosive powder, does not sludge out in the operating tank.
- Phoscote is economical to use on both steel and aluminum due to low using concentration and ease of application.

Further information supplied upon request.

CHEMCO PRODUCTS CO., Inc.

7740 WEST 47TH STREET **LYONS, ILLINOIS**

Arco Insulated Grommet and Spreader Pliers. Automotive Rubber Co., Inc., 8601 Epworth Blvd., Detroit 4, Mich., has prepared illustrated data sheets on its Series 3120 "Sta-Put" Rubber-Covered Grommet and expanding hand tool.

Brake Shoe "Auto Bake". A mobile infra-red oven, this product is discussed and illustrated in a four-page bulletin prepared by the Kellogg Div., American Brake Shoe Co., 93 Humboldt St., Rochester 9, New York.

"What's The Hottest Item in Metal Preparation Today?" is the title of a bulletin prepared by Behr-Manning, Troy, N. Y., which discusses and illustrates the company's line of coated abrasive belts and their many uses.

"Gun Guard" Oil Spray, a rust preventive oil and lubricant for spray application to metal parts and fabrications in storage and production, is discused in a bulletin released by The Mitchell-Bradford Chemical Co., 2446 Main St., Stratford, Connecticut.

Permacel Masker No. 7K. General assembly and operating instructions are included in a four-page illustrated bulletin issued by the Industrial Tape Corp., New Brunswick, N. J. Masking paper and paper masking tape are also described and illustrated.

Tygon Corrosion-Resistant Paint. The U. S. Stoneware Co., P. O. Box 350, Akron 9, Ohio, has issued **Bulletin 712** which presents the facts about Tygon Paint, where and how to use it, and where not to use it. Tables, based almost entirely on field experience, show the chemical corrosion resistance of Tygon paint.

Taber Abraser. The Taber Instrument Corp., 115 Goundry St., North Tonawanda, N. Y., has available **Bulletin 5003** which discusses and illustrates the Taber Abraser Model 140 Standard Abrasion Testing Set. Specifications, operating characteristics, and uses are given.

Unichrome Stop-Off Compounds, quick-hardening, wax-like materials that are especially suitable for work with sharp edges or on complicated shapes, are discussed in a four-page leaflet issued by United Chromium, Inc., 100 E. 42nd St., New York 17, New York.

Surface Active Agents. An eight-page folder, **No. F-5900,** entitled "Tergitol Surface Active Agents" is available to manufacturers in the wet processing industries from Carbide and Carbon Chemicals Div., Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y. Properties, uses, and specifications of Tergitol Wetting Agents 7 and P-29 and of Tergitol Penetrants 4, 08, and EH are given. Data on average wetting times in solutions of the different products in various acid, base, and salt solutions are presented, along with information on the effects of organic solvents on wetting time. A useful table for the selection of the most efficient Tergitol surface active agent for any given application is featured.

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Eastern Centrifugal Pumps. Bulletin 100, released by Eastern Industries, Inc., New Haven, Conn., describes and illustrates Eastern Centrifugal Pumps, together with complete engineering data, diagrams, and suggestions.

Rubber and Plastic Linings. Metalweld, Inc., 2617 Hunting Park Ave., Philadelphia 29, Pa., is offering a four-page illustrated bulletin describing the processes it employs and its facilities.

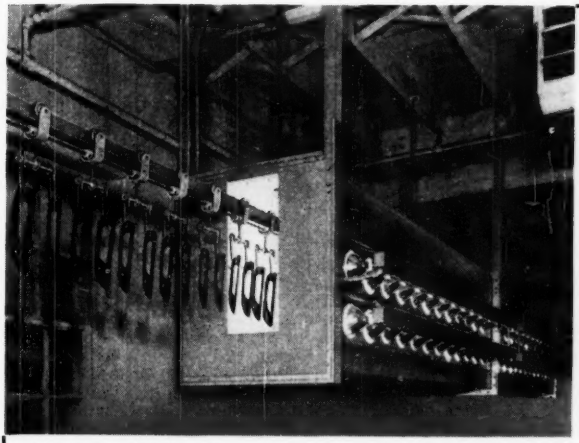
Uformite F-233 Baking Hammer Finish, which will show good uniformity on both horizontal and vertical surfaces, is the subject of a two-page data sheet available from the Rohm & Haas Co., Washington Sq., Philadelphia 5, Pennsylvania.

Technical Instructions on BBZ-200 Process for bright zinc plating in barrels are the subject of an eight-page well illustrated bulletin prepared by the Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

Daniel Flow Gauge. A four-page folder presenting properties and applications of its Daniel Flow Gauge for silk screen paints and pastes for roller mills can be obtained from Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda, Maryland.

Electrical Equipment. Bulletin 2-200, released by The Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, Ohio, is a comprehensive, overall view of E.P. custom-built equipment for industry. Products included are a.c. and d.c. motors and generators, motor-generators, frequency changers, battery chargers, and electrolytic power supplies.

"Antara Surfactants—What They Are and What They Do" is the title of a two-color, eight-page booklet distributed by Antara Products, 444 Madison Ave., New York 22, N. Y. Illustrated throughout, the booklet describes applications of surface active agents to several industrial fields. A complete list of Antara Surfactants and their many uses are included. Copy is available by request on company letterhead.



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get information on how **TRIANGLE INFRA-RED OVENS** can increase your output and lower costs.

Our laboratory will test your products (no cost) and design equipment to suit your requirements — or alter your present equipment for changed production. Send for a bulletin.

If you are planning to conveyorize your plant for speedier production, get the details on the TIPP CABLE-WAY CONVEYOR, illustrated above. Designed for your requirements. Quickly installed. Readily altered for changed production. Operates in combination with or independently of infra-red ovens. A bulletin on request.

TRIANGLE EQUIPMENT CO., INC., ***Designers, Engineers, Manufacturers***
45 RIVER ROAD • NUTLEY, N. J.
Successors to RADIANT HEAT DIVISION, C. M. HALL LAMP CO., Detroit.

"Description and Instructions on the Hunter Multipurpose Reflectometer" is the title of a ten-page bulletin released by the Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Md.

Anodes and Plating Chemicals. Bulletin AC-106 presents briefly and conveniently the many anodes and plating chemicals available from the Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

Rampe Universal Portable Tumbler-Mixer, its specifications, applications, and advantages, are featured in a catalog page distributed by the Rampe Manufacturing Co., 3209 Prospect Ave., Cleveland 15, Ohio.

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125,000

SISALIN BUFFS

(Slightly Used)

11" — 12" — 13" Diameter

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Samples Submitted

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Glass Immersion Heater. A leaflet describing the characteristics of its line of immersion heaters made with electrical heating elements sealed in quartz, Vycor, or Pyrex glass tubes is available from The Glass-Quar Co., 90 Manhattan Ave., Brooklyn 6, New York.

Goodrich Industrial Vacuum Hose for handling dust, abrasive scrap, and toxic fumes is the subject of Catalog Section 4780, issued by The B. F. Goodrich Co., Akron, Ohio. The publication pictures and describes the construction of the various lines and types of hose, lists recommended uses, and provides specifications.

"All Under One Roof" is the title of a six-page brochure which portrays the work of scientists, engineers, consultants and laboratories at Sam Tour & Co., Inc., 44 Trinity Pl., New York 6, N. Y. Illustrated with action photographs of jobs both in the laboratory and field, it explains the scope of the services available from the company and touches on such subjects as research, process development, product development, production methods, evaluations, expert testimony, investigations, non-destructive testing and inspecting, laboratory testing, and analysis.

Tumb-L-Matic Compounds and Processes. Lupomatic Industries, Inc., 4510 Bullard Ave., New York 70, N. Y., has issued **Bulletin PC-50** covering Tumb-L-Matic processes, compounds, and carriers. The bulletin describes basic steps for completely finishing metal and plastic parts by wet and dry tumbling processes. The effects of each of the three most widely used Tumb-L-Matic operations—cutting, smoothing, and lustering—are discussed fully.

The bulletin also contains general information on the proper use of various compounds and carriers. Four charts indicate specifically which Tumb-L-Matic compound-carrier combination should be used for the different operations conducted in both the wet and dry processes.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

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PAINT STRIPPING

We remove Baked, Air-dried, Plastic and all other finishes from all metals or glass. Send sample of your product for cost estimate, or write:

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Will BUY your dirty THINNERS and SOLVENTS. Send sample or letter giving approximate contents and solids. The Johann Company, Room 416, 1180 E. 63rd St., Chicago, Ill.

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We have a few excellent and established territories available to salesmen qualified to represent well rated manufacturer of metal cleaning machinery. Valuable increasing solvent sales guarantee steady monthly income. Address Box No. 92, c/o PRODUCTS FINISHING, 431 Main Street, Cincinnati 2, Ohio.

SUPERVISOR

Large sheet metal manufacturer, 50 years in business, wants man to head up all finishing. Dip, spray, bonderizing, etc. Man with working knowledge of paint chemistry; practical factory experience. Excellent opportunity. Replies confidential. Write: Personnel Dept., Lyon Metal Products, Inc., Aurora, Illinois.

ATTENTION PAINT SUPERVISORS!

Desire applications from paint foremen experienced with dip and spray baking enamels, also graining of sheet metal products. Man with chemical training desired, but not essential. Fine opportunity for the right man. Address Box No. 91, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

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BAKING OVEN FOR METAL FINISHES

Practically unused. Excellent construction. Double compartment, each compartment with front and rear doors. Inside measures 4' 6" wide, 9' long, 6' 3" high; total size 11' x 9' x 8'. Equipped with remote 1,000,000 BTU burner unit. Produces temperature to 400° F. Burns propane or manufactured gas; 12,000 CFM recirculating fan; 2400 CFM exhaust fan. Can be seen in operation. Further details on request. Reasonably priced. A lot of trucks also available.

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VIKON TILE CORP.

Phone 1030 Washington, N. J.

"The A-B-C's of Aluminum" is the title of a 96-page book which presents in simple non-technical language the complete story of aluminum. The text is divided into three principal sections: "A" is for Alloys, the big family of metals called "aluminum," their production and fabrication; "B" is devoted to Benefits, the many natural advantages of aluminum and how they serve us; and "C" covers Consumption, the many new and amazing uses for aluminum, and its fascinating potentials.

A special feature is the series of 69 pictures and charts which are arranged in sequence to present a pictorial story showing how aluminum is produced from raw ore, made into metallic aluminum, and then processed to form sheet, rod, bar, and other aluminum mill products. In addition, pictures of typical fabricating operations are included.

The book is available by request on company letterhead from the Reynolds Metals Co., 2500 S. Third St., Louisville 1, Kentucky.

The Finishing Touch — *By J. A. Patterson*

"Was it maybe a gold baseball you lost?"

How Production-Wise Manufacturers

SAVE SANDING COSTS

FINISHING METAL

This manufacturer of automatic dishwashers, dissatisfied with other abrasives, switched to AP's No. 80 Jewelox Cloth X73. Now reports: "This cloth is the best we've ever used!"

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This manufacturer called in AP Engineers on problem of finishing plastic switch plates. Cool-running AP Silver Streak Belts were recommended. Result: Silver Streaks did 25% more work than other belts — eliminated spoilage — cost not a penny more.

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BELTS
DISKS
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SPECIAL SHAPES
Cloth, Paper, Fibre or Combination Backing

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BUY THROUGH YOUR INDUSTRIAL DISTRIBUTOR

ACP Phosphate Coating Chemicals and Processes. American Chemical Paint Co., Ambler, Pa., has released its 12-page Technical Service Data Sheet No. P-100-46 which discusses its phosphate coating chemicals and processes for paint-bonding, rust proofing, protecting friction surfaces, and improving drawing and extrusion. The bulletin is illustrated throughout with application photographs, together with many tables.

Vanton Non-Corrosive "Flex-i-liner" Pump is the subject of a two-color bulletin released by the Vanton Pump Corp., Empire State Bldg., New York 1, N. Y. Complete technical data are presented, together with illustrations, on this pump which has been designed for handling a large group of acids, alkalies, and industrial alcohols, in addition to many other corrosive liquids and gases.

Unichrome Resist Sheet, Rod, and Tubing for use wherever a solid insulating material is needed are the topics of a four-page leaflet available from United Chromium, Inc., 100 E. 42nd St., New York 17, New York.

Catalogs

FOR YOUR LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Finishing Equipment
"Mahon Industrial Equipment," including Complete Finishing Systems for Enamel; Lacquer; Paint and Varnish; Spray Pickling Equipment; Metal Cleaning and Rust Proofing Equipment; Dry-off Ovens; Filtered Air Supply Systems; Hydro-Filter Spray Booths; Drying and Baking Ovens; Core Ovens; Dust Collecting Systems, is described in a booklet available from R. C. Mahon Company, Detroit 11, Michigan.

2. Heavy-Duty Cleaning Compound
A heavy-duty, alkaline cleaning compound developed for the cleaning of steel prior to vitreous enameling, Detrex 70, is described in a folder released by Detrex Corp., Detroit 32, Michigan.

3. Synthetic Resins
The Hercules Powder Co., Wilmington, Del., has available a 20-page technical booklet which describes the properties and lists the uses of the synthetic resins manufactured by the company.

4. Industrial Enamels
"Pittsburgh Standard Industrial Enamels" is the title of a color card issued by the Pittsburgh Plate Glass Co., Industrial Paint Div., Pittsburgh 22, Pa. The card contains color samples and recommendations for surface preparation and finish application.

5. Electroplating Tape
Physical and chemical properties of "Scotch" electroplating tape, general functions in electroplating, insulation protection, and application procedure for plating racks are contained in a data sheet published by the Minnesota Mining & Manufacturing Co., St. Paul 6, Minn.

6. Tank Heater
"Platecoil," a lightweight embossed plate for tank heating, is discussed as to installation, operation, features, and advantages in Bulletin P-50 released by the Kold-Hold Manufacturing Co., Lansing, Michigan.

7. Buffing and Polishing Compounds
A four-page pocket-size guide for purchasers of polishing and buffing compounds is available from the Mosher Co., Chicopee, Massachusetts.

8. Industrial Washing Machines
Factors to be considered in making a proper choice of equipment for thoroughly cleaning metal products are described in a 28-page book published by The Alvey-Ferguson Co., Cincinnati 9, Ohio.

9. Corrosion-Resisting Alloys and Equipment
Durco Corrosion-Resisting Alloys and Equipment for the chemical process industries are described in General Catalog M available from The Duriron Co., Inc., Dayton 1, Ohio.

10. Metal Cleaning Guide
Oakite Products, Inc., New York, N. Y., has prepared a 44-page booklet which reviews metal cleaning in all its phases. Discussed are specific materials, equipment, and procedures for removal of fabricating operation soils, together with other information.

11. Buffs
A folder describing in detail the advantages of Jackson Airway Ventilated Buffs is available from the Jackson Buff Corp., Long Island City 1, New York.

12. Dust Control Systems
Young & Bertke Co., Cincinnati, Ohio, has prepared a booklet picturing and describing its method of solving the dust problems created in various industrial plants.

13. Black Finish
Data sheets describing the Controlled Oxidation Pentrate process for black oxide finishing of steel can be obtained from the Heatbath Corp., Springfield 1, Masschusetts.

14. Bright Nickel Plating
Udylite Bright Nickel Plating Process and its advantages are the subject of Bulletin 51, distributed by The Udylite Corp., Detroit 11, Michigan.

15. Synthetic Finish

"Dimenso," a synthetic finish that is designed to provide two colors in one spray operation, is described in a booklet now available from The Sherwin-Williams Co., Cleveland 1, Ohio.

16. Phosphate Coating Chemicals and Processes

Technical Service Data Sheet No. P-100-46 discussing its phosphate coating chemicals and processes for paint-bonding, rust proofing, protecting friction surfaces, and improving drawing and extrusion may be obtained from the American Chemical Paint Co., Ambler, Pennsylvania.

17. Infra-Red Ovens

How to step up efficiency in drying, baking, preheating, and dehydrating operations with the use of Jensen New Principle "Dual Heat" Infra-Red Ovens is the topic of a four-page catalog released by Jensen Specialities, Inc., Detroit, Michigan.

18. Spray Booths

Catalog 480 describing the Schmieg Centri-Merge Spray Booths for the elimination of paint overspray, with photographs and blueprint reproduction of typical plant installations, can be obtained from Schmieg Industries, Inc., Detroit, Michigan.

19. Unit Dust Collectors

The Kirk & Blum Mfg. Co., Cincinnati, Ohio, has issued a four-page catalog providing complete engineering data on its Type "M" Unit Dust Collectors.

20. Corrosion Resistant Coating

A descriptive folder containing specifications and application data on "Rust-Chek", a corrosion resistant product undercoat, is available from the Rinshed-Mason Co., Detroit 10, Michigan.

21. Metal Surface Preparation

The Parker Rust Proof Co., Detroit 11, Mich., has issued a catalog describing the Bonderizing process, as applied to steel, aluminum, zinc, die castings, and alloys, designed to preserve fine finishes by anchoring the applied paint film and retarding corrosion.

22. Spray Booth Maintenance

A folder outlining certain practices of spray booth maintenance with the various chemical products supplied for the purpose is available from the Crescent Chemical Corp., Perth Amboy, N. J. The products described include D-Zolvzit for water curtain paint spray booths, Booth Mask and E-Kon-O-Kote for spray booth masking purpose, and Float-Eez to assist in floating certain paints yet preventing adhesion to spray booth baffles.

23. Troxide Bulletin

Troxide, dry acid salt compound for pickling prior to porcelain enameling, is described in a technical bulletin issued by MacDermid, Inc., Waterbury, Connecticut.

24. Clear Lacquer

The Randolph Products Co., Carlstadt, N. J., has issued a folder which contains helpful, technical, and factual information on clear lacquer.

25. Air Compressors

Bulletin CK-101 providing full details on its 7½, 10, and 15 h.p., 4-cylinder "V" type air compressors can be obtained from The DeVilbiss Co., Toledo, Ohio.

26. Liquid Processing Equipment

Filters, mixers, pumps, tanks, and other standard units developed to meet the varying demands of customers are shown and described in a 24-page catalog prepared by the Alsop Engineering Co., Milldale, Connecticut.

27. Polishing and Buffing Equipment

Frederic B. Stevens, Inc., Detroit 16 Mich., has issued Catalog No. 27 which describes and illustrates materials and methods for polishing, buffing, and descaling operations, together with helpful production hints.

28. Solvent Vapor Degreasers

Blakeslee Solvent Vapor Degreasers, their operating characteristics, features, and advantages, are explained and illustrated in full detail in a 20-page booklet available from G. S. Blakeslee & Co., Chicago, Illinois.

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